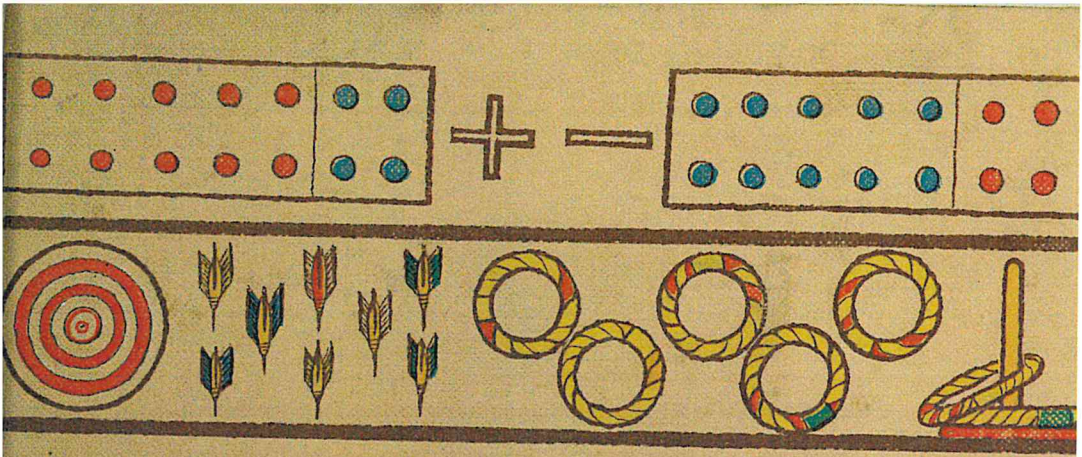


THE SCRIBNER

ARITHMETIC

4

THE
SCRIBNER

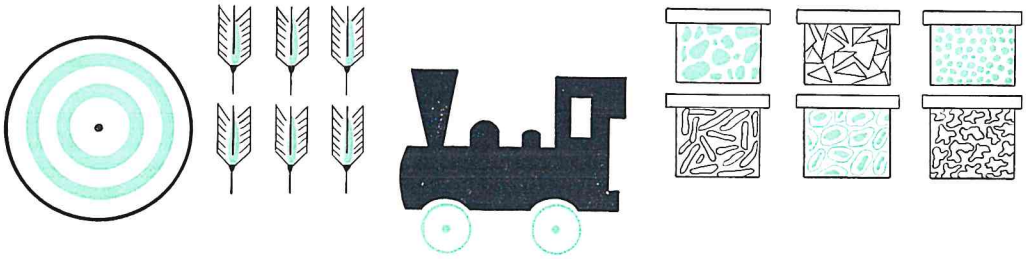
Arithmetic

BOOK 4

THE SCRIBNER

by RICHARD MADDEN LESLIE S. BEATTY

WILLIAM A. GAGER



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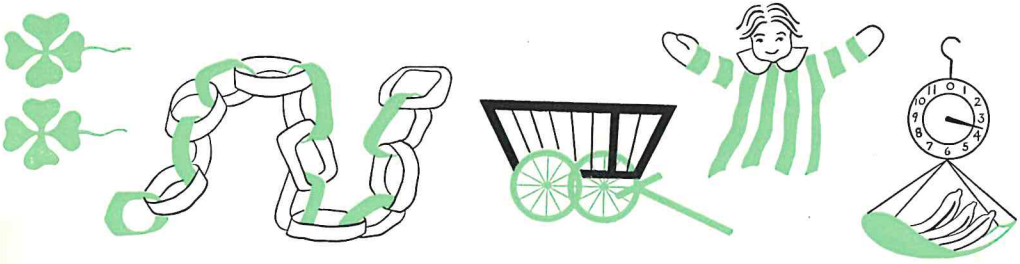
ARITHMETIC

BOOK 4



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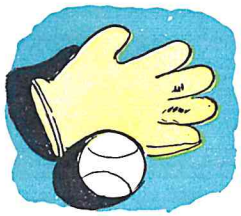
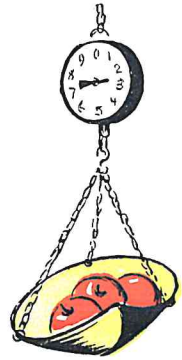

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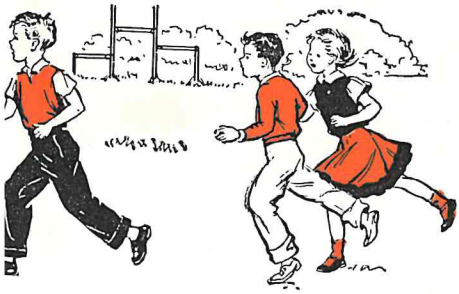

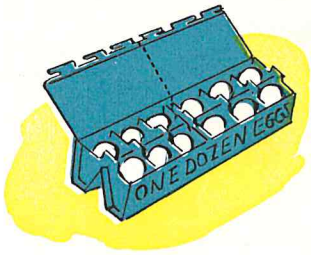

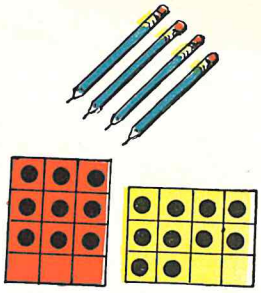

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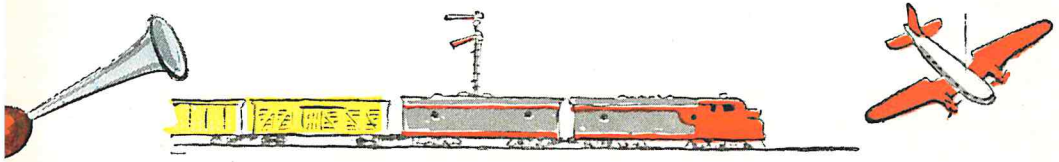
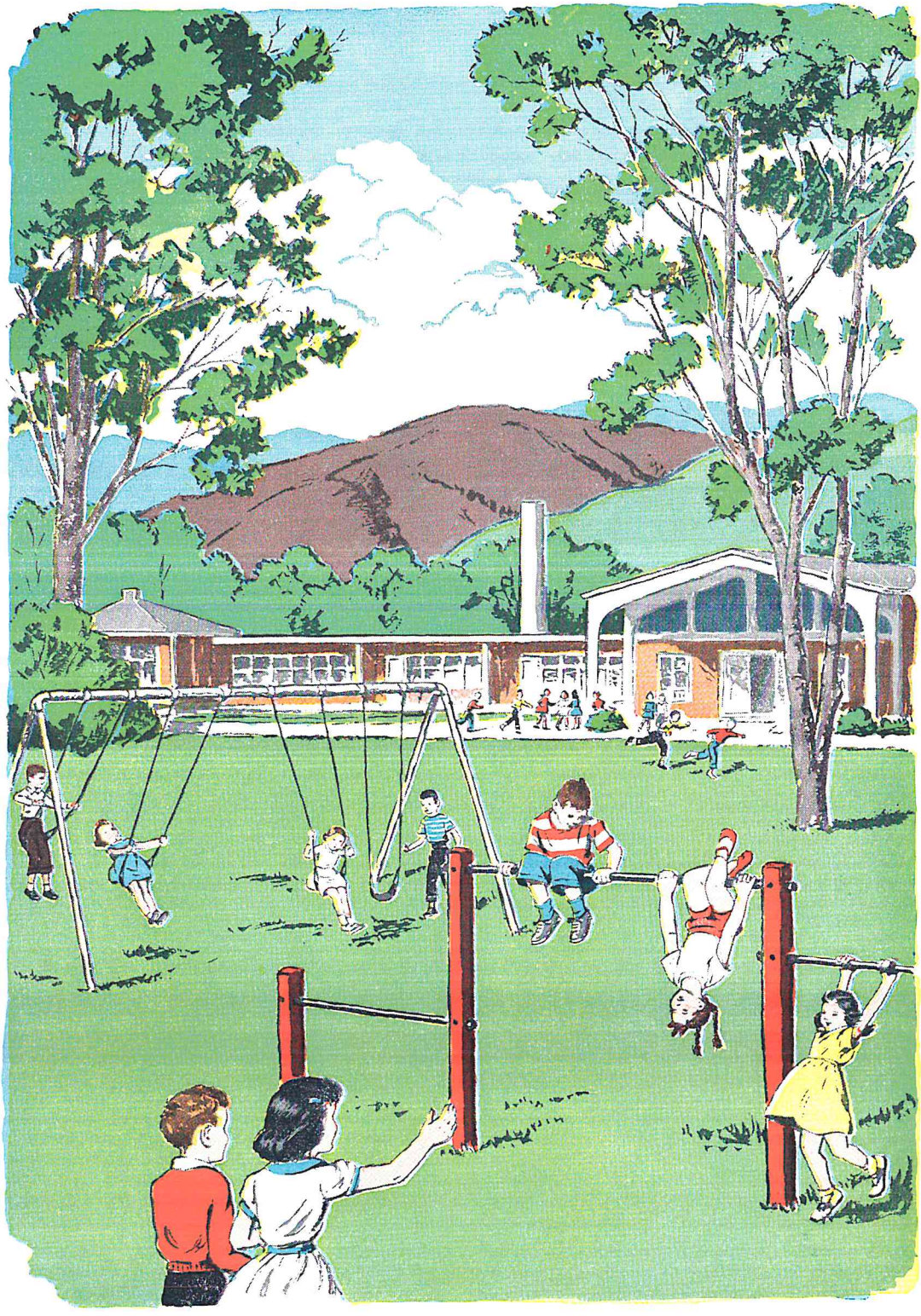


ACKNOWLEDGMENTS

The authors wish to thank especially Mrs. Jane Genin Plenty and Miss Anna C. Paxton who carefully read the entire manuscript and made many comments that were invaluable.

THE SCRIBNER *Arithmetic*

BOOK 4



ARITHMETIC AT SCHOOL

NEW FRIENDS

A new school year brings new friends. Tom and Sue are new in their school. They want to learn all about it.

Belonging	Here today	Absent
Boys 15	14	1
Girls 13	13	0
28	27	1

1. How many children are in Miss Jones' room?

2. How many girls are there in your room? How many boys? How many children all together?

3. Are there more boys or more girls in your room? How many more?

4. How many swings do you see in the picture? Do you have as many swings on your playground?

5. How many bars do you see in the picture? At which side is the lowest bar? Where is the highest bar?

6. The first recess begins at 10:15 and ends at 10:30.

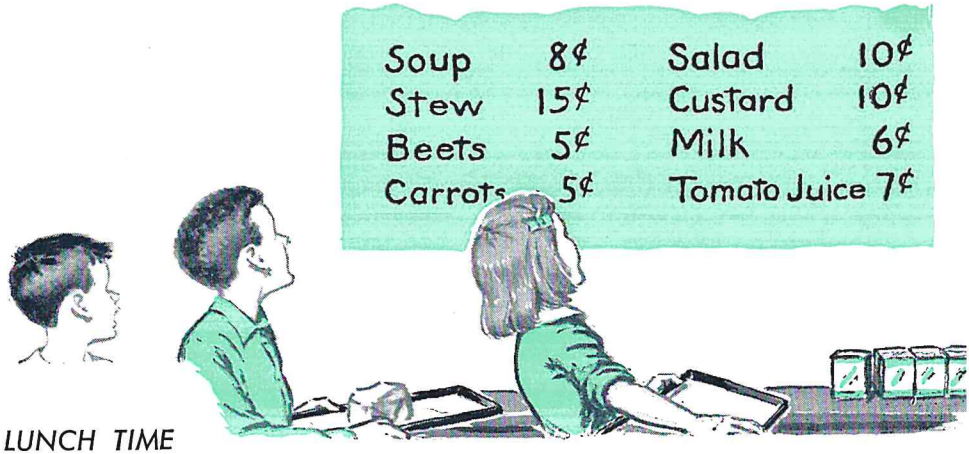
Tom comes to school at 8:30. Lunch time begins at 11:40.

A *B* *C* *D*

Which clock shows when recess begins? when Tom comes to school? when the lunch time begins? when the first recess ends? How many minutes is the recess?

7. When does your recess begin? How long is it? When does your lunch time begin? When does it end? How long is your lunch time?

8. What month is this? What day of the month?



LUNCH TIME

Sue buys her lunch at the school lunchroom. Can you buy your lunch at your school?

1. Sue can choose her lunch from this list. How many cents will Sue pay for stew, beets, custard, and milk? Can you count the money she needs?

2. Tom brings sandwiches from home. He buys tomato juice and custard. How much must he pay?

3. Ann brings sandwiches and an apple from home. She buys soup and milk. How much does she pay?

4. Which costs *more*
- **a.** soup or stew?
- **b.** tomato juice or milk?
- **c.** soup or custard?

5. Which costs *less*
- **a.** carrots or salad?
- **b.** stew or salad?
- **c.** soup or milk?

6. Which one thing costs the most? Which two things cost the least?

7. Which things on the menu are the same price?

8. Jim's lunch costs 35¢. He gives 50¢ to pay for it. Will Jim get some change? How much?

Bob goes home for lunch. He can ride his bicycle home in 5 minutes. It takes him 20 minutes to eat his lunch. He always helps his mother for 5 minutes after lunch. Then he goes back to school. About how long will Bob be gone from school?

HOW MANY CHILDREN?

	Belonging	Here today	Absent
Boys	16	16	0
Girls	15	13	2
	31	29	2

The children in each room are counted every day. Here is the count for Miss Jones' room for today. Turn back to page 1 to see how many children were there on that day.

1. Has the number of children belonging in the room changed?

2. In what way has it changed?

3. Are more boys or girls absent today?

4. How many children were gone each day?

5. The table below shows the number of children at school in three grades today. Which grades are they?

	Kindergarten		First Grade			Second Grade		
	A	B	A	B	C	A	B	C
Number Belonging	24	26	32	33	33	32	34	33
Here Today	20	21	31	32	31	32	31	32

6. How many classes are there in these three grades?

7. How many children are here today in each grade?

8. Which grade has the most children here today?

9. Is there any class with no children absent?

10. Which class has most children belonging to it?

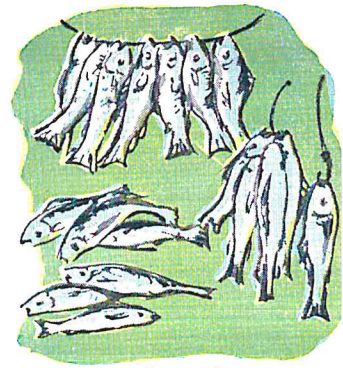
What is the largest number in each group below?

11.	47	74	57	19	**14.**	91	37	97	88
12.	19	84	39	49	**15.**	11	9	60	59
13.	72	65	29	66	**16.**	46	33	27	47

SUMMER FUN

What did you do this summer?

1. Jim and his family went to the lake in their trailer. They stayed two weeks. It cost $7 a week to park the trailer. How much was the cost for parking the trailer while they were at the lake?



2. At the lake Jim caught 7 fish, his brother caught 6 fish, and his father caught 5. How many fish did they catch all together?

3. Dot and Helen went to camp. They arrived the morning of August 2 and left camp the morning of August 19. How many days were they at camp?

4. One day Jean and Mary bought 2 glasses of lemonade. They paid 5¢ a glass. How much money did they pay all together?

5. Ted spent the summer on a farm. He gathered eggs from the hens' nests. The first week he gathered 12 eggs, the next week 11 eggs, and the third week 16 eggs. How many eggs did he gather in all?

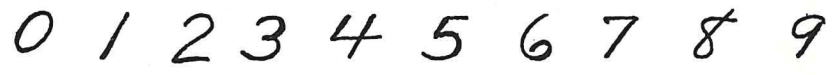
6. Patsy helped her mother take care of the baby 3 days each week during July. Mother paid Patsy 25¢ a day. How much money did Patsy earn each week?

7. Bert joined the summer reading club at the library. He planned to read 13 books but read only 7. How many fewer books did he read than he had planned to read?

8. Write two problems about things you did this summer.

HOW WELL DO YOU REMEMBER?

Can you make good digits? Here are the 10 digits we use to write numbers.

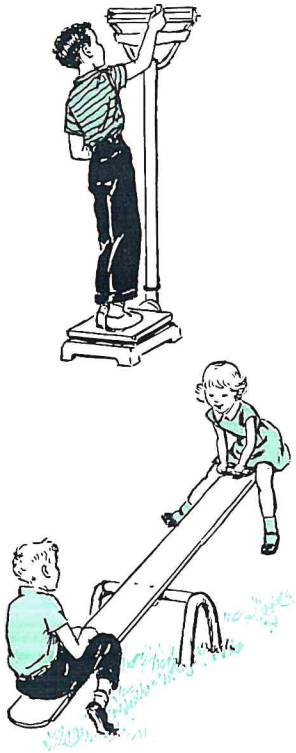


Copy and answer these additions:

	a	b	c	d	e	f	g	h	i
1.	3	4	2	4	1	7	4	1	2
	2	6	6	3	8	3	2	2	7
2.	3	2	3	1	7	3	2	4	6
	5	4	7	3	2	4	8	1	2
3.	5	1	5	2	9	4	6	3	2
	5	6	3	2	1	5	4	3	5
4.	3	4	5	6	1	8	5	1	2
	6	4	2	3	7	2	4	5	3

Copy and answer these subtractions:

	a	b	c	d	e	f	g	h	i
5.	6	7	10	9	4	7	10	8	7
	−2	−6	−2	−5	−3	−5	−4	−6	−3
6.	9	8	10	6	5	9	7	10	4
	−8	−3	−6	−5	−2	−7	−4	−5	−2
7.	9	10	5	3	10	9	8	8	7
	−3	−9	−1	−2	−8	−4	−1	−5	−2
8.	6	8	10	9	6	8	9	10	5
	−3	−2	−3	−6	−4	−4	−2	−7	−3



THE HEALTH OFFICE

The children are being weighed and measured in the health office.

1. How are the scales like a seesaw? Does the weight move out farther to balance the big boy? Whenever a boy or girl is heavy, the scale weight must be moved out to balance.

Which child on the seesaw is heavier?

2. Balance a yardstick. See if something light a long way from the center can balance something heavy that is close to the center.

3. The heavier child in the picture weighs 88 pounds. The lighter child weighs 54 pounds. What is the difference between their weights?

4. A year ago these two children weighed 74 pounds and 51 pounds. How much has each gained?

5. One child measures 59 inches. Another child is 46 inches tall. Is the difference more or less than a foot?

6. Bob grew 3 inches last year. Which one of the lines at the right is 3 inches long?

7. How long is **b**? **c**?

8. How many feet are there in a yard? Are most of the children in your class more than a yard tall?

9. Estimate how long some things in your room are and then measure them. Practice until you can estimate well. Measure the desk, a table, the chalkboard, paper, and other things.

a. **b.** **c.**

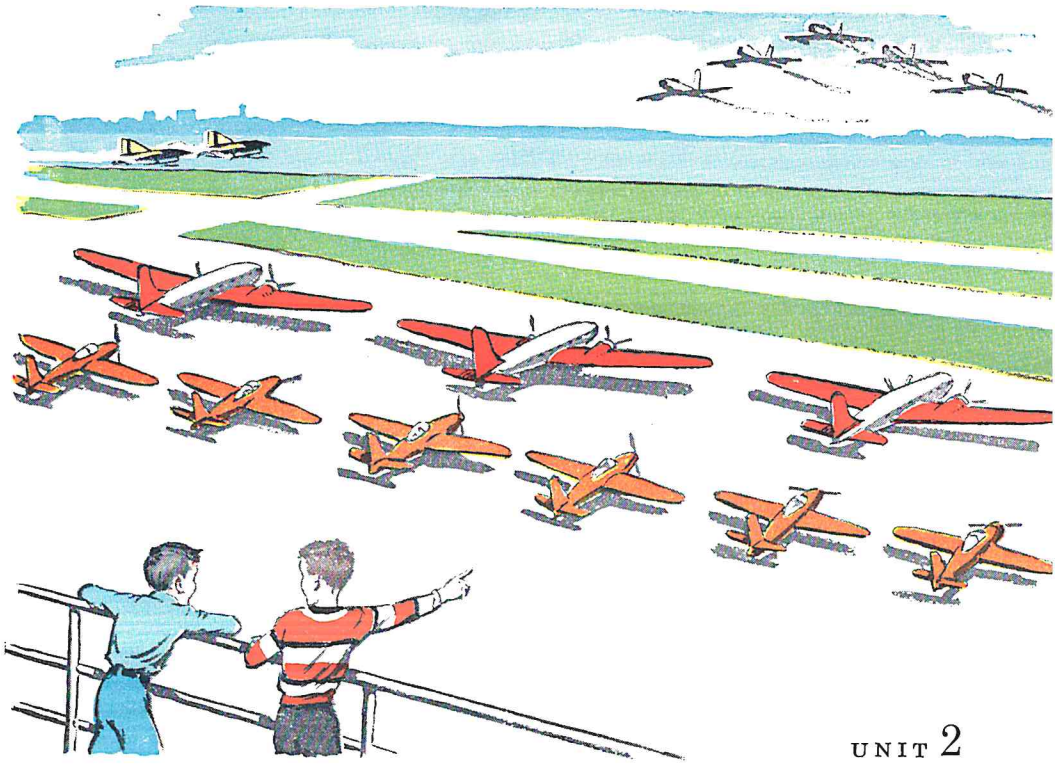
HOW WELL DO YOU REMEMBER?

Copy and answer these subtractions:

	a	b	c	d	e	f	g	h	i
1.	10	9	8	12	10	11	7	9	8
	−8	−2	−6	−8	−7	−4	−2	−5	−3
2.	11	10	7	14	10	9	10	11	12
	−6	−9	−3	−7	−2	−4	−6	−2	−5
3.	7	9	8	10	12	9	10	11	7
	−4	−3	−5	−3	−4	−7	−4	−8	−5
4.	11	8	9	12	11	12	6	12	11
	−9	−2	−6	−7	−5	−3	−2	−9	−7

Copy and answer these additions:

	a	b	c	d	e	f	g	h	i
5.	5	8	4	8	4	5	7	3	9
	4	3	6	8	2	6	2	8	9
6.	2	6	7	9	3	2	4	6	2
	3	4	7	3	5	8	3	5	7
7.	8	7	5	4	3	6	9	4	2
	4	3	2	7	4	3	2	5	6
8.	7	3	5	2	3	6	4	3	8
	4	9	3	9	7	2	8	6	2



UNIT 2

ADDITION AND SUBTRACTION

THE AIR SHOW

Tom and Jim went to see an air show. Tom's father took this picture.

1. How many airplanes are on the water?

2. How many airplanes are on the ground?

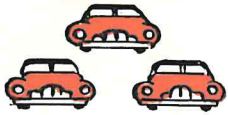
3. How many of the planes on the ground have twin engines? How many of them have single engines?

4. How many fewer airplanes are in the air than on the ground?

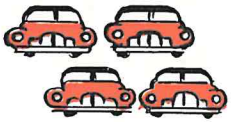
5. How many airplanes are in the picture all together?

6. Make up some number problems about the picture or about airplanes you have seen.

PUTTING GROUPS TOGETHER



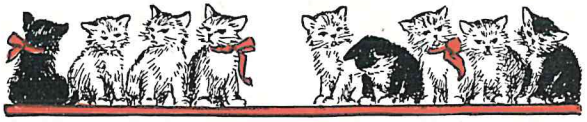
1. Here are Tom's cars and Bob's cars. How many cars have both boys? Count the cars. Add 3 and 4. Is it quicker for you to think "3 and 4 are 7" than to count the cars?



2. Ben has 4 kittens and Jack has 5. How many kittens have both boys together? Will counters help you? You can use a counter to stand for another thing.

These are their kittens:

These are your counters: a four-card and a five-card.



One square stands for each kitten. You can use your counters to put one group of kittens with the other group of kittens. You can't bring the kittens to school, but you can use counters to stand for them.

3. Ben lives on a farm. At the farm there are 3 pigs in one pen and 5 pigs in another. How many pigs are there in both pens?

4. Carol has 4 big dolls and 6 little dolls. How many dolls has she in all?

5. How many are 9 puppies and 7 more?

6. Peg has 7 hair bows. Her grandmother gives her 3 more. How many bows does she have now?

7. A pencil costs 6 cents. An eraser costs 5 cents. How much do both cost?

8. What is the cost all together of a 2-cent eraser, a 5-cent pencil, and a 5-cent ruler?

CARDS THAT WILL HELP YOU

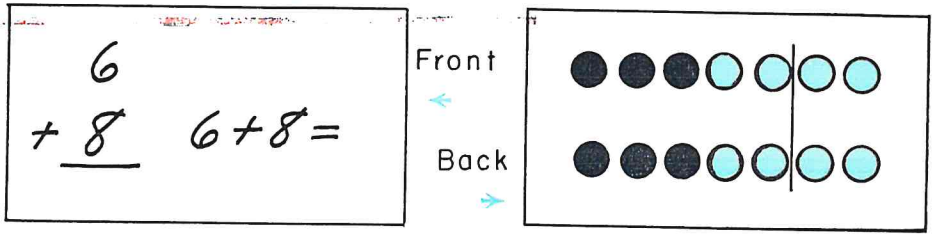
Do you want to answer additions and subtractions quickly? Here is a way that will help you think the answers quickly. Make a card for each fact that you need to learn. Use cards 3 inches wide and 5 inches long.

1. Make addition cards this way:

a. Make 6 dots. Color them black.

b. Make 8 dots. Make them another color.

c. If there are more than 10 dots in all, draw a line after ten dots.



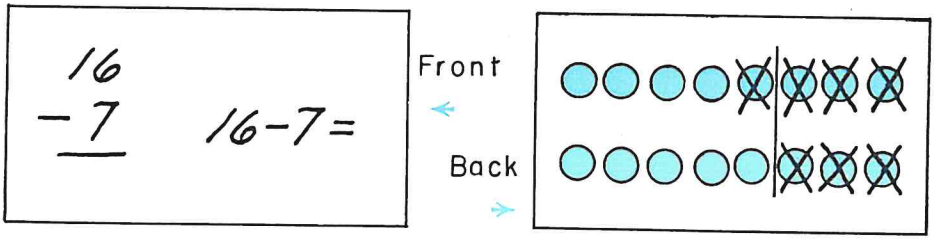
2. Does the card show that 6 + 8 equals 10 + 4, or 14? Do not write the answer on the card. You want to work the answer out each time until you know it quickly.

3. Make subtraction cards this way:

a. Make 10 dots. Draw a line after them.

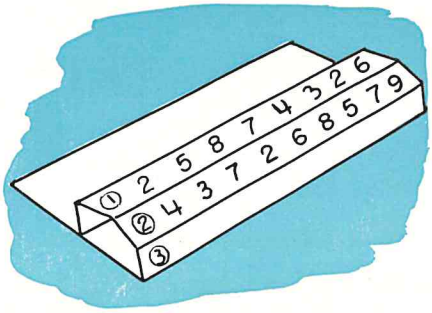
b. Make 6 dots. Does 10 + 6 = 16?

c. You are subtracting 7 from 16. Begin at the right and cross off 7 dots.



4. Does the card show that 16 − 7 = 9?

HOW TO USE FOLDED PAPER



Here is a way to fold a piece of paper so that you will not have to copy examples. You fold it over for each row. Place it right under the examples.

Addition. Use folded paper.

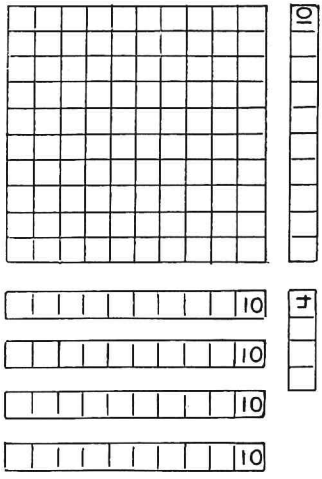
	a	b	c	d	e	f	g	h	i
1.	8	1	5	2	1	3	1	4	2
	2	6	3	2	8	4	9	5	5
2.	3	4	2	4	6	7	3	4	3
	2	6	6	3	4	2	7	2	5
3.	1	5	1	2	6	2	7	1	2
	3	5	4	8	2	4	3	2	7
4.	1	5	2	4	6	5	3	1	3
	5	4	3	4	3	2	3	7	6

Subtraction. Use folded paper.

	a	b	c	d	e	f	g	h	i
5.	9	6	9	8	5	7	10	8	5
	−7	−5	−6	−4	−3	−4	−3	−2	−4
6.	7	9	8	9	10	3	6	10	8
	−2	−3	−7	−4	−8	−2	−3	−9	−5
7.	6	10	4	10	8	9	10	5	9
	−4	−5	−2	−7	−3	−2	−6	−2	−8
8.	7	8	10	7	4	9	10	7	6
	−3	−6	−4	−5	−3	−5	−2	−6	−2

USING NUMBER COUNTERS

Miss Adams' class made number counters to help them think about addition and subtraction facts.

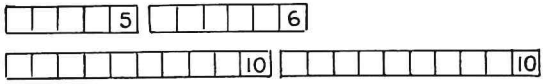


Each boy and girl marked one-inch squares on three pieces of tagboard. The pieces of oak tagboard were 11 inches wide and 14 inches long.

One piece was cut into a square 10 inches long and 10 inches wide, five strips of *tens*, and one strip of *four*. The square and the strips are shown at the left.

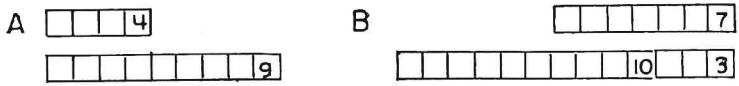
From the other two pieces, each pupil cut 19 more tens; 1 *four*; and 2 each of 2's, 3's, 5's, 6's, 7's, 8's, and 9's; and 34 *ones*.

1. The counters may be used to learn the addition facts by matching with tens or with each other. Here is the way Tom thinks about 5 + 6.



Tom easily sees that 5 and 6 are 11. He puts other numbers together to learn their sums quickly.

2. Tom also uses the counters to learn to subtract. He lays them side by side. What is the difference between each pair of counters? Put the ten-card close to the three-card.



If you still have trouble with some of the facts, counters or number cards will help you. But your goal is to say the answers almost as easily as you say your name. You will need to practice.

HOW WELL DO YOU REMEMBER?

Set 1. Addition

Use folded paper.

	a	b	c	d	e	f	g	h	i
1.	5	6	7	8	7	6	4	8	9
	7	9	7	3	9	8	7	9	2
2.	6	9	8	6	5	9	6	4	2
	5	4	7	6	9	8	7	8	9
3.	8	7	9	9	7	3	8	5	8
	5	4	5	9	8	9	6	6	8
4.	7	4	9	8	7	3	9	5	9
	5	9	7	4	6	8	6	8	3

Set 2. Addition

Copy and answer. Write the ones, tens, and hundreds in their own columns.

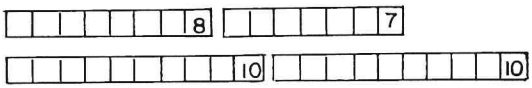
	a	b	c	d	e	f	g	h	i
1.	32	54	51	13	41	82	95	41	28
	65	55	28	94	67	32	93	43	31
2.	97	62	26	85	72	33	63	84	93
	12	61	92	21	46	71	45	83	22
3.	25	43	75	86	97	53	72	53	71
	84	85	64	41	51	76	84	63	71
4.	31	62	44	71	64	36	41	92	51
	86	37	91	35	52	93	72	36	84

WAYS OF THINKING ABOUT ADDITION AND SUBTRACTION

Do you need to stop to think about some of the addition and subtraction facts? Or do you know them so well that you can say them without stopping to think? Children who know the answers well, learned them by thinking about them.

1. Here are some of the ways children think about $8 + 7$:

TOM

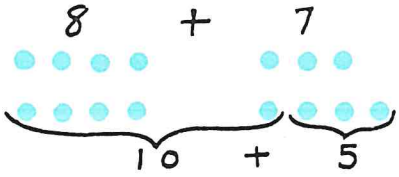


ANN THINKS OF $7 + 7$ and 1 more.
BETH KNOWS $8 + 8 = 16$, so she thinks $8 + 7$ is one less.

BOB THINKS:

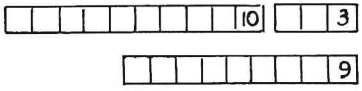
$8 + 2 = 10$, and
$10 + 5 = 15$

8 8 7
8 7 7
16 ? 14



Some children use dot pictures for help. Bill says $8 + 7$ is the same as $10 + 5$. The dots help him to reason.

2. Doris uses counters like Tom's to help her think subtractions. She does this. Move ten and three closer.



Can you see the difference between 13 and 9? Doris can think out almost any number fact she needs.

Peg doesn't need the cards. She knows that $13 - 10$ is 3, so $13 - 9$ has to be 4.

Can you say the facts quickly without cards?

HOW WELL DO YOU REMEMBER?

Set 1. Subtraction

Use folded paper.

	a	b	c	d	e	f	g	h	i
1.	11 − 5	15 − 7	18 − 9	12 − 7	13 − 9	12 − 4	14 − 8	11 − 9	12 − 6
2.	16 − 7	11 − 4	14 − 9	12 − 3	13 − 6	15 − 9	16 − 8	14 − 5	11 − 3
3.	12 − 5	13 − 4	15 − 8	11 − 7	14 − 6	13 − 8	17 − 9	15 − 6	11 − 8
4.	14 − 7	11 − 2	13 − 5	12 − 9	17 − 8	11 − 6	12 − 8	16 − 9	13 − 7

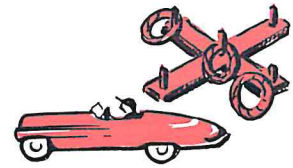
Set 2. Subtraction

Copy and answer. Write the ones, tens, and hundreds in their own columns.

	a	b	c	d	e	f	g	h
1.	149 − 61	136 − 74	125 − 43	138 − 84	129 − 56	115 − 21	158 − 65	119 − 87
2.	125 − 64	163 − 92	139 − 54	147 − 56	119 − 73	147 − 82	116 − 93	178 − 92
3.	137 − 44	154 − 92	119 − 32	186 − 91	125 − 82	178 − 87	137 − 65	124 − 31
4.	148 − 96	117 − 43	169 − 75	157 − 81	138 − 93	156 − 75	118 − 51	124 − 73

USING ADDITION

1. How many toys do the children have? Jim has 4 toys, Mary has 3, and Tom has 2.



2. How many cookies are on the plate? There are 5 with raisins, 4 with nuts, and 3 without raisins or nuts.

3. At the doll party there are 3 dolls with blue dresses, 6 with white dresses, and 4 with red dresses. How many dolls are at the party?

4. In our room 5 girls and 8 boys have bicycles. How many children in our room have bicycles?

5. Ann is counting the kittens. There are 3 black ones, 4 gray ones, and 2 with mixed colors. How many kittens does Ann count?

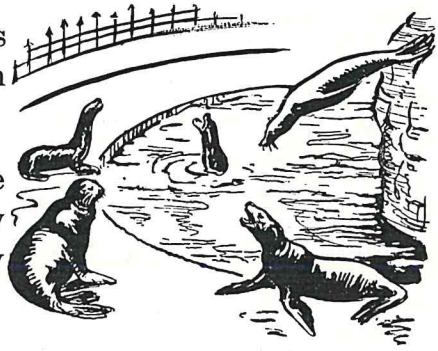
PRACTICE

Copy these and add:

	a	b	c	d	e	f	g	h
1.	6	2	4	7	6	5	2	3
	2	3	4	2	1	3	5	2
	4	8	7	8	9	6	4	9
2.	44	93	72	95	62	93	85	64
	72	54	67	72	96	23	34	75
3.	83	99	92	54	76	27	68	73
	85	40	64	53	53	91	81	86

HOW MANY ARE LEFT?

You may use counters to answer these problems:



1. Kay is watching 5 seals at the zoo. When 3 seals swim away, how many are left?

2. Ruth received 16 picture post cards from her friends. How many did she lose if she has only 9 left?

3. Bill has 8 cents. He spends 5 of them. How many does he have left?

4. There are 15 birds at Bob's bird bath. When 6 birds fly away, how many are left?

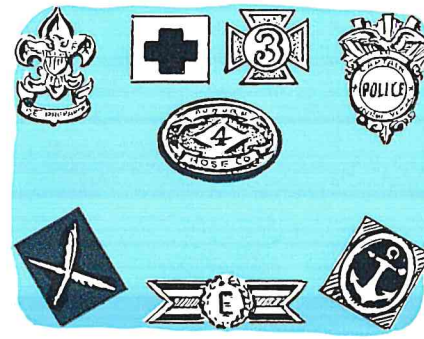
5. John picks 7 boxes of strawberries. A man buys 3 boxes. How many are left?

6. Bob and Ruth make 18 pieces of candy. They give 9 pieces to the other children. How many pieces of candy are left?

7. Bert has 6 melons for sale. A man buys 2. How many are left? When Bert sells 3 more, how many will be left?

8. Tim found 13 eggs in the nest. Four of them were broken. How many eggs were not broken?

The number left is called the **remainder.** What does **remain** mean?



WHAT IS THE DIFFERENCE?

1. Joe has 5 badges. Bill has 3 badges. What is the difference between the numbers they have?

2. Alice is 9 years old. John is 13 years old. What is the difference between their ages?

3. Jane scores 13 points in a game of beanbag throw. Nancy scores 8 points. What is the difference?

4. In Tom's room there are 9 girls and 18 boys. Do you think that is a big difference?

5. What are the differences between these numbers?

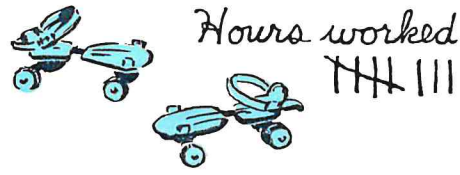
a. 6 and 12	5 and 9	15 and 7	14 and 6
b. 13 and 4	8 and 15	5 and 12	9 and 16
c. 17 and 8	6 and 15	9 and 4	8 and 7

HOW MANY MORE ARE NEEDED?

6. How many more cents does John need? He wants to buy a toy airplane. It costs 15¢. He has 9¢.

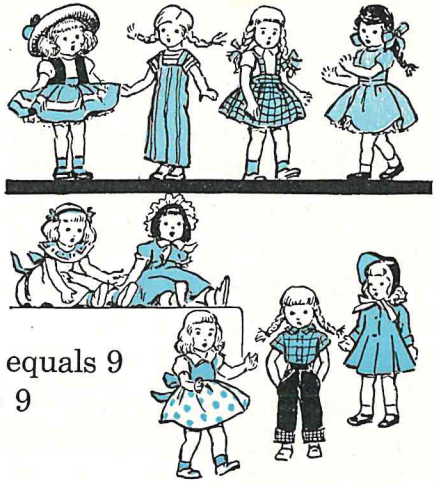
7. Dick takes music lessons. He should practice 9 hours each week. He has already done 5 hours this week. How many more hours should he practice this week?

8. Jim can earn a new pair of roller skates by working 15 hours. See his record. How many more hours must he work?



9. Mary has only 5 pencils left. There are still 9 children who need pencils. How many more pencils must Mary get for them?

READING THE SIGNS



Alice has 4 dolls and Dora has 5 dolls. How many have they together?

Here are ways to think and say this problem:

4 and 5 are 9
4 plus 5 is 9
4 plus 5 equals 9
4 + 5 = 9

All these mean the same thing.

• When we add, the answer is called the **sum.** We can say, "The sum of 4 plus 5 is 9."

$$\begin{array}{r} 4 \\ \text{plus} \rightarrow +5 \\ \hline \text{sum} \rightarrow 9 \end{array}$$

When we take one number from another number, we use the minus sign (−).

$$\begin{array}{r} 12 \\ \text{minus sign} \; -8 \\ \hline 4 \end{array}$$

the **remainder,** or **difference**

• When we subtract, the answer is called the **remainder** or **difference.**

Add or subtract. Use folded paper. Fold it up and down. Watch the signs.

1. 6 + 4	**11.** 7 + 9	**21.** 16 − 8	**31.** 6 + 9
2. 8 − 3	**12.** 8 + 5	**22.** 7 + 6	**32.** 12 − 7
3. 9 + 7	**13.** 15 − 8	**23.** 9 + 8	**33.** 8 + 7
4. 5 + 8	**14.** 18 − 9	**24.** 15 − 6	**34.** 15 − 9
5. 14 − 5	**15.** 9 + 6	**25.** 11 − 4	**35.** 6 + 8
6. 13 − 9	**16.** 14 − 9	**26.** 14 − 8	**36.** 9 + 3
7. 4 + 7	**17.** 8 + 9	**27.** 8 + 8	**37.** 17 − 9
8. 17 − 8	**18.** 16 − 9	**28.** 5 + 9	**38.** 5 + 7
9. 7 + 8	**19.** 9 + 4	**29.** 13 − 6	**39.** 13 − 8
10. 13 − 7	**20.** 11 − 7	**30.** 16 − 7	**40.** 6 + 7

WHAT IS THE OTHER NUMBER?

1. There are 12 girls in Miss Adams' fourth grade. Seven of the girls come to school on the bus. How many do not come on the bus?

2. Eight girls are in the Book Club. Miss Adams asked 5 of them to make covers for the new books. The rest will make book cards. How many will make cards?

3. There are 13 boys in the fourth grade. Four are absent. How many boys are here?

4. The class plans to give a play. Twelve pupils are needed for the parts. Three of the parts are for girls. How many parts are for boys?

5. The other 13 pupils will make costumes for the play. Seven are making hats and the rest are making collars. How many are making collars?

6. The nineteen children of the third grade have been invited to see the play. Eight of them are boys. How many are girls?

7. Nine boys in Grade 4 are Cub Scouts. Three rode their bicycles to the Scout meeting today. How many came some other way?

8. Nine of the 13 boys play on the baseball team. How many boys are not on the team?

9. Miss Adams sent 3 of the 12 girls to help another teacher. The rest read library books. How many were reading?

10. Ten boys and 4 girls in the room own bicycles. How many children do not own bicycles?

▶ ZEROS IN SUBTRACTION

1. Miss Adams has 60 pencils for the class to use. She puts 30 of them away. How many does she keep for use now?

0 ones minus 0 ones is _?_.
6 tens minus 3 tens is _?_.

→ 60 − 30

2. Martha has a collection of 36 Indian dolls. Her aunt just gave her 20 of them. How many dolls did she have before?

If you take 0 from 6, the answer is _?_.
3 tens minus 2 tens is _?_.

→ 36 − 20

3. There are 108 children in three fourth grades. If your room has 36 of them, how many are in the other two rooms?

8 − 6 = _?_
How many tens are in one hundred?
Does 3 tens from 10 tens leave 7 tens?

→ 108 − 36

4. Sixteen of the 36 children walk to school. The rest come by bus. How many come by bus?

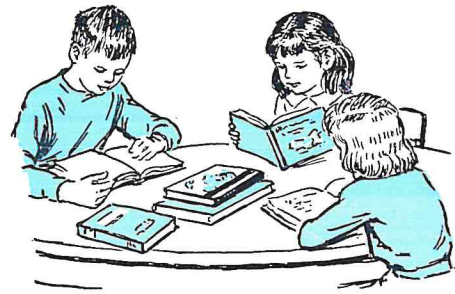
Tell how to do the subtraction.

PRACTICE

Use folded paper.

	a	b	c	d	e	f
1.	60 − 20	40 − 10	78 − 20	89 − 49	35 − 10	92 − 72
2.	105 − 22	104 − 74	100 − 40	107 − 20	69 − 35	16 − 6
3.	67 − 57	109 − 38	123 − 23	101 − 10	107 − 94	103 − 60

ADDING AND SUBTRACTING HUNDREDS



1. How many pages did Peg read in two weeks? She read a book of 122 pages one week and a book of 133 pages the next week.

Tell how to add the example. Do you add hundreds the way you add ones and tens?

$$\begin{array}{r} 122 \\ +133 \\ \hline \end{array}$$

2. How many more pages has Jim to read? His big book about space ships has 248 pages. He has read 116 of them.

Tell how to subtract the example. Do you subtract hundreds the way you subtract ones and tens?

$$\begin{array}{r} 248 \\ -116 \\ \hline \end{array}$$

3. Tell a problem for each example below. Then tell how to find the answer.

a	b	c	d	e	f
72	168	196	185	139	201
+54	−95	−51	+12	−4	+7

PRACTICE

Copy and answer. Add in Rows 1 and 2.

	a	b	c	d	e	f	g
1.	743	81	74	112	324	46	54
	126	95	65	5	63	73	94
2.	73	57	203	543	65	102	86
	95	82	64	303	84	7	72
3.	198	167	695	136	174	158	145
	−32	−4	−461	−53	−92	−85	−64
4.	117	185	149	158	157	367	139
	−35	−92	−37	−63	−72	−123	−42

CHECKING SUBTRACTION

When you have 8 and take away 3, you have how many left? If you put the 5 and 3 back together, how many will you have?

You can always check your subtraction by putting the two parts of the group together again. See how we check these:

minuend → 8
subtrahend → 3
remainder → 5
or
difference

SUBTRACT	CHECK	SUBTRACT	CHECK
36	21	148	75
15	+15	73	+73
21	36	75	148

> To check subtraction, you add the subtrahend to the difference. The sum of these must always equal the minuend.

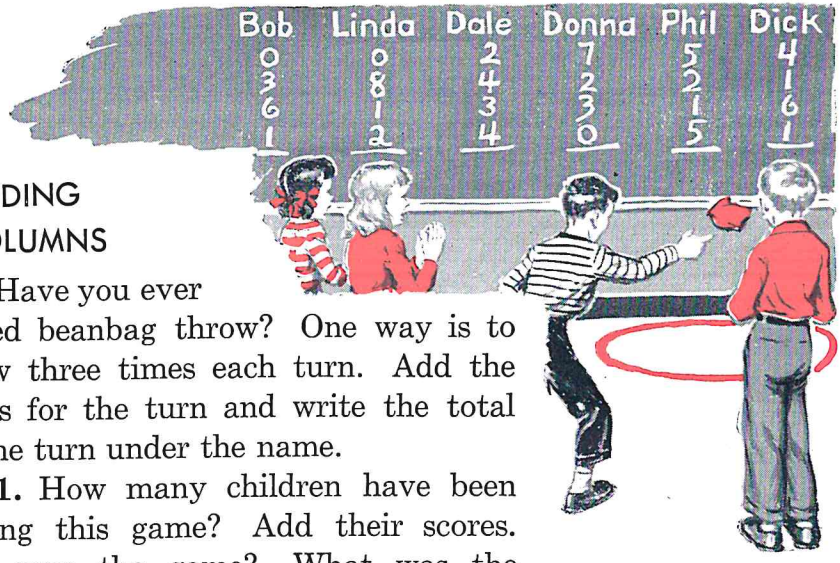
Above is the long way to check. Here is a short way:

✓ ✓	Add 3 and 4.	165	3 and 2 are 5.
47	Then add 2 and 2.	−72	9 and 7 are 16.
−24	The answer is 47, so 23	93	165 checks.
23	is correct.		93 is correct

PRACTICE

Copy and subtract. Check the first row by the long way. Check the second row by the short way.

	a	b	c	d	e	f	g	h
1.	115	789	798	169	117	184	126	923
	63	254	436	86	45	30	94	701
2.	162	148	869	296	136	144	179	107
	91	72	712	52	80	63	79	53



ADDING COLUMNS

Have you ever played beanbag throw? One way is to throw three times each turn. Add the scores for the turn and write the total for the turn under the name.

1. How many children have been playing this game? Add their scores. Who won the game? What was the winning score? Which two children tied for first?

When you add columns, begin at the top and add downward. Begin with the ones.

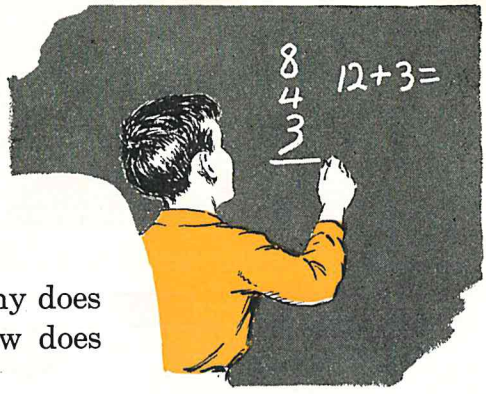
2. This is the way to add two columns.

	THINK:		THEN THINK:		CAN YOU THINK THIS WAY?
23	*"3 and 2 are 5.*	23	*"2 and 4 are 6.*	23	*3, 5, 9;*
42	*5 and 4*	42	*6 and 1*	42	*2, 6, 7*
14	*are 9.*	14	*are 7.*	14	
	Write 9 ones." →	9	*Write 7 tens."* →	79	

PRACTICE

Use folded paper.

	a	b	c	d	e	f	g	h	i
1.	20	41	46	33	30	30	11	12	72
	30	33	11	21	13	13	41	66	4
	30	12	12	25	26	34	55	41	63
2.	51	93	12	52	15	3	32	82	45
	12	64	80	2	74	83	22	71	33
	45	2	96	94	80	92	75	4	90



HELP WITH COLUMN ADDITION

Joe is adding a column. Why does he need to add 12 and 3? How does knowing $2 + 3 = 5$ help Joe?

1. If $8 + 1 = 9$, then $18 + 1 =$ ___?___; $28 + 1 =$ ___?___.

2. If $2 + 6 = 8$, then $12 + 6 =$ ___?___; $22 + 6 =$ ___?___.

3. Say the sums quickly:

a. $1 + 8$ $\quad 11 + 8$ $\quad 21 + 8$ $\quad$ **c.** $2 + 7$ $\quad 12 + 7$ $\quad 22 + 7$

b. $1 + 7$ $\quad 11 + 7$ $\quad 21 + 7$ $\quad$ **d.** $3 + 6$ $\quad 13 + 6$ $\quad 23 + 6$

PRACTICE

Use folded paper.

1. Add 2 to each sum below:

7	9	8	4	7	8	9	6
7	8	7	9	5	8	2	8

2. Add 3 to each sum below:

6	4	9	4	2	6	9	5
9	8	5	7	8	6	7	8

3. Add 4 to each sum below:

3	8	7	9	7	3	6	9
8	6	3	4	8	9	4	6

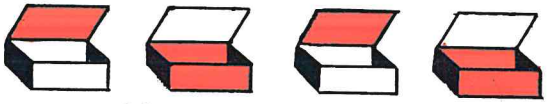
4. Add 5 to each sum below:

6	8	5	4	9	6	8	3
7	3	9	6	3	5	5	7

ADD THINGS ONLY TO LIKE THINGS

Do 2 books and 2 books make 4 books?

Do 2 boxes and 2 boxes make 4 boxes?



How many are 2 boxes and 2 books? They are still just 2 boxes and 2 books. They are not 4 of one thing.

2 dimes and 2 dimes are 4 dimes. 2 cents and 2 cents are 4 cents. If you add dimes to cents, you must first think of the dimes as cents.

Four Coins but 22 ¢

2 dimes and 2 cents are 22 cents. You think of each dime as changed to ten cents.

1 dime = 10¢
1 dime = 10¢
1 cent = 1¢
1 cent = 1¢
22¢

You can add different kinds of things after you change them all to the same kind.

When you add numbers, you must always add ones to ones, tens to tens, hundreds to hundreds, and thousands to thousands.

1. Read these numbers: 42 + 321 + 5. Put them in columns. Add.

```
 42
321
  5
```

Write these numbers in columns and add them:

2. 32 + 844 + 21

3. 435 + 321 + 3

4. 351 + 14 + 122

5. 22 + 5 + 271

6. 17 + 132 + 600

7. 215 + 342 + 32

CHECKING ADDITION

When you add, you must be sure you are right. What ways of checking do you think will help you?

Louise says she adds downward twice.

Nancy says she adds twice; first she adds downward, then she adds upward.

4
7
3
5
19

LOUISE SAYS:	NANCY SAYS:
"4, 11, 14, 19."	"4, 11, 14, 19."
Then she says it again.	Then she says, "5, 8, 15, 19."

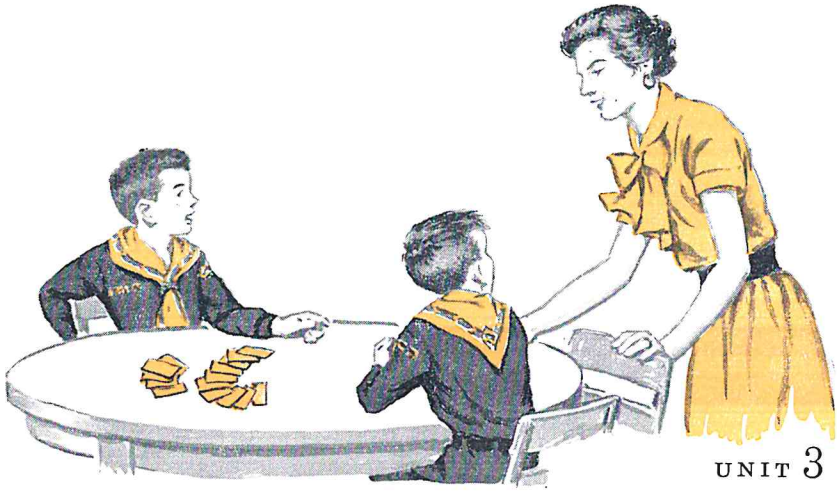
Suppose Louise makes a mistake. She may say that 14 and 5 are 18. If she does it each time, she has not found her mistake.

Nancy's way is better. The second time she has different facts, but she still must get the same answer.

> To check addition, first add downward. Then add again, but the second time start at the bottom of the column and add upward.

Add these downward. Check them by adding upward:

	a	b	c	d	e	f	g	h
1.	5	3	7	6	6	3	6	2
	6	5	4	2	5	6	4	9
	2	4	1	3	6	3	2	4
	4	4	6	5	2	5	7	3
2.	6	4	9	3	5	7	7	8
	3	8	6	8	8	0	6	6
	5	4	2	1	5	5	2	2
	3	2	0	3	1	6	2	3



UNIT 3

OUR NUMBER SYSTEM

SCOUT CIRCUS TICKETS

Tom and Jim are in charge of selling tickets for the Scout circus. Mrs. White is helping.

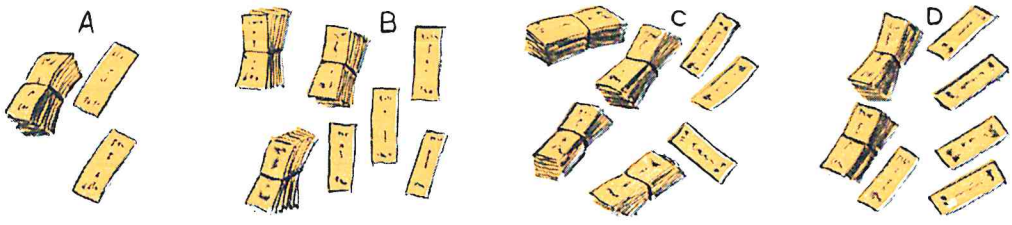
"If you first put the tickets into bundles of ten," Mrs. White said, "you'll find it much easier to count them."

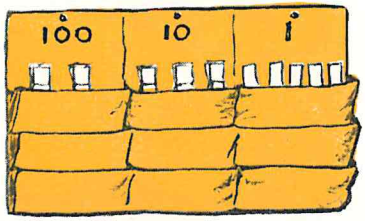
Tom and Jim did that. Then they started to count. "Ten, twen*ty*, thir*ty*, for*ty*, fif*ty*, six*ty*, seven*ty*, eigh*ty*, nine*ty*," and so on they counted.

1. What do you think the *-ty* stands for? What do you think the other parts of these words with *-ty* tell us?

2. How would Tom and Jim give each Scout 15 tickets to sell? Fifteen tickets are how many tens and how many ones?

3. What is the number of tickets in each group below? There are 10 in each bundle.





THE MEANING OF HUNDREDS AND THOUSANDS

1. Can you read the number that Jim has written on the chalkboard? Is it two hundred thirty-five?

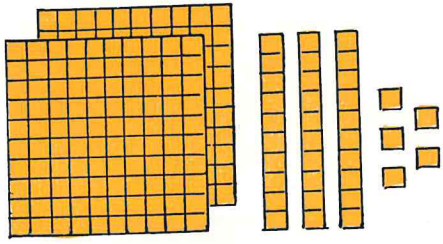
2. Look at the pocket chart. How many single tickets are in ones' pocket?

3. How many bundles of 10 are in tens' pocket?

4. Jim put 10 tickets in each bundle and took 10 bundles to make a package of 100. Was Jim right? How many tens are there in 100?

5. How many tickets are in the pocket chart?

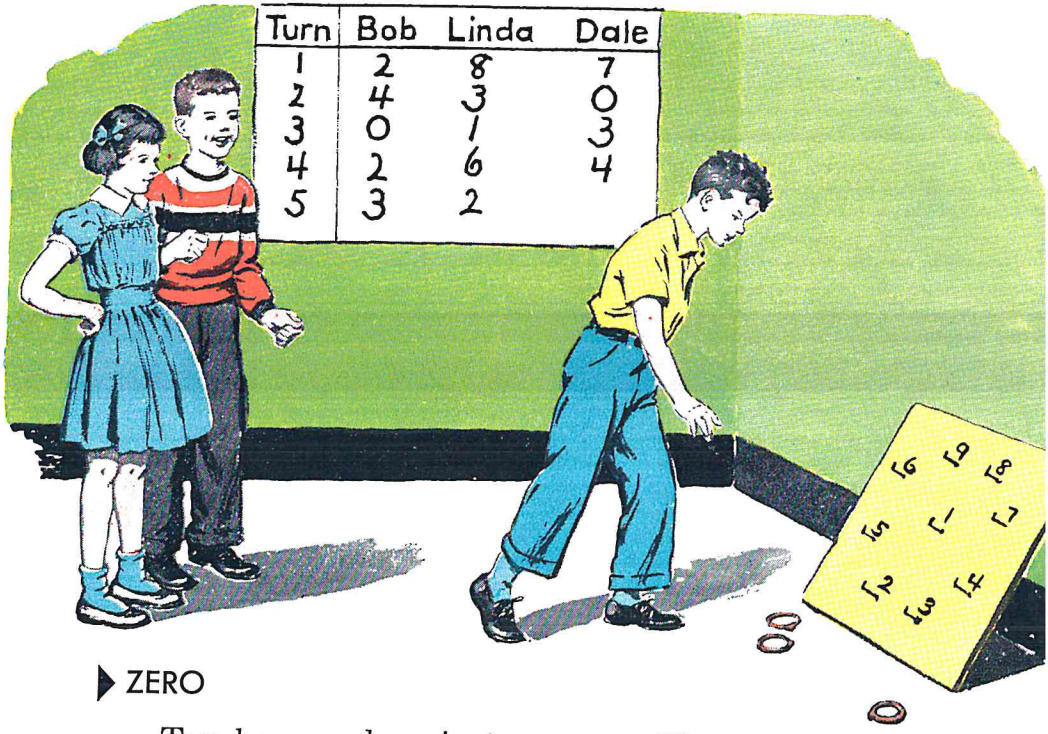
6. Nancy uses her counters on her desk to make 235. Explain how her counters show 235.



The place at the left of hundreds' place is thousands' place. Ten packages of 100 tickets make one thousand.

7. How many of Nancy's squares of 100 make 1000?

8. How many tens in 100?



ZERO

Two boys made a ringtoss game. They used a piece of plywood 2 feet wide and 2 feet high. They put in 9 hooks for pegs. They could have used nails. They put a number above each peg. The board is set against the wall.

1. Three rings are thrown each turn. Dale has the last turn. He misses all three throws. What will his last score be?

2. Zero means "*not any.*" Which turn did Bob score "*not any*?" How is "*not any*" marked?

Did Linda score on a peg every turn?

3. Did anybody ring the 9? How do you know?

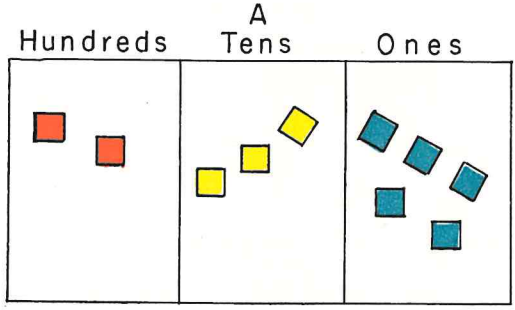
4. Did anybody ring the 5? Can you tell?

Who will bring a 6-penny, an 8-penny, and a 10-penny nail to class to tell about nail sizes? Which size would be best for a ring-toss game?

ZERO AND PLACE VALUE

Here are some counters on a counting board.

A



1. How many hundreds are there? tens? ones?

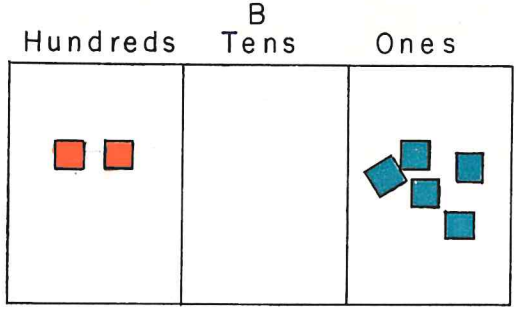
2. How many things have been counted?

3. Write the number that the counters show on counting board *A*.

4. How is the number shown on counting board *A* different from the number shown on counting board *B*?

Does counting board *B* show two hundred five (205)?

B



5. Does two hundred equal 20 tens? Does two hundred five equal 20 tens and 5 ones?

6. You can think of 205 in three ways:

205	ones	→ 205
20	tens, 5 ones	→ 205
2	hundreds, no tens, 5 ones	→ 205

> Zero is a digit that tells us how many ones, or tens, or hundreds there are, just as any other digit does. Zero tells us there are "not any" in the place where it is used.

7. Write these numbers:

five hundred	six hundred ten	four hundred one
two hundred six	one hundred one	six hundred forty

READING AND WRITING LARGE NUMBERS

1. This is the way we write the numbers:

one	1
ten	10
one hundred	100
one thousand	1000
ten thousand	10,000

A comma is used to make large numbers easier to read. A comma is always used with 5-place numbers, such as 10,000 or 12,624. It is sometimes used with 4-place numbers, but most often not.

2. This is the way to read large numbers:

THE NUMBER	HOW TO SAY IT
210	Two hundred ten
426	Four hundred twenty-six
859	Eight hundred fifty-nine
1607	One thousand, six hundred seven or Sixteen hundred seven
12,345	Twelve thousand, three hundred forty-five

Do not say **and** after **hundred** or after **thousand.**

3. Say these numbers: 321 430 110 218 1584

4. Write with digits: two hundred sixteen; four hundred twenty; two thousand, three hundred forty-two.

5. Read these: **a.** 346 **b.** 5642 **c.** 399 **d.** 11,541 **e.** 485 **f.** 8537 **g.** 7420 **h.** 16,356.

6. Which four means most? **a.** 842 **b.** 423 **c.** 634

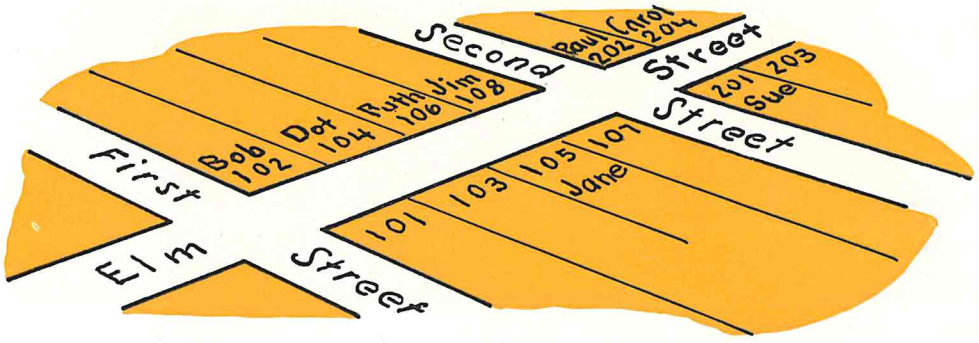
7. Which five means most? **a.** 625 **b.** 652 **c.** 562

8. Which seven means most? **a.** 7238 **b.** 673 **c.** 947

9. Which six means most? **a.** 631 **b.** 426 **c.** 6865

10. In what three ways can you think of 324?

Ten ones are a ten. Ten tens are a hundred. Ten hundreds are a thousand. But ten thousands are just called ten thousand.



NUMBERS USED TO TELL ORDER

1. Who lives at the corner of First and Elm Street?

2. Who lives at 106 Elm Street? at 105 Elm Street?

3. Read Paul's street and number. Say, "two-oh-two."

4. Which girl lives next to Paul? across from Ruth?

5. Who lives on the same side of Elm Street as does Sue?

6. Which girl do you think lives nearest Third Street?

7. Look in the Index of this book. On what pages does it say you can find out about zero?

8. What letter of the alphabet comes first in order?

9. What letter comes between *r* and *t* in the alphabet?

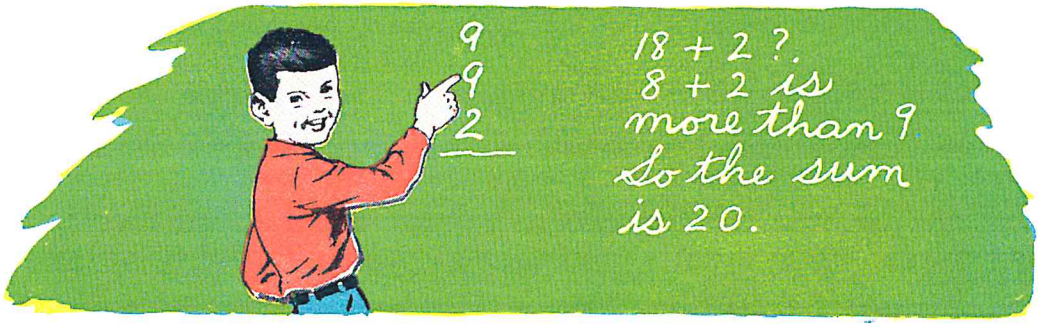
10. Here is the Ranger's secret code. Each letter is a number. The first word is **stop.** Can you read the rest?

CODE:

1	2	3	4	5	6	7	8	9	10	11	12	13	14
a	b	c	d	e	f	g	h	i	j	k	l	m	n
15	16	17	18	19	20	21	22	23	24	25	26		
o	p	q	r	s	t	u	v	w	x	y	z		

S T O P

THE MESSAGE: 19 20 15 16 18 5 4 3 1 18.
13 9 19 19 9 14 7 13 1 16 9 19 9 14
20 18 21 14 11.



MORE HELP WITH COLUMN ADDITION

1. Why does Joe need to add 18 and 2? How does knowing 8 + 2 help him?

2. Which sums below are more than 9?

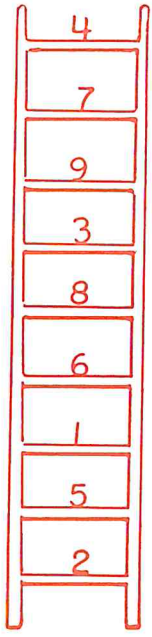
a. 3 + 8	**c.** 4 + 6	**e.** 3 + 5	**g.** 9 + 4
b. 5 + 2	**d.** 8 + 9	**f.** 6 + 8	**h.** 5 + 7

3. If 6 + 4 = 10, then 16 + 4 = ___?___; 26 + 4 = ___?___.

4. If 4 + 8 = 12, then 14 + 8 = ___?___; 24 + 8 = ___?___.

5. Which sums below are in the teens? in the twenties?

a. 19 + 1	**c.** 12 + 2	**e.** 17 + 3	**g.** 17 + 7
b. 18 + 8	**d.** 15 + 6	**f.** 13 + 4	**h.** 13 + 9



CLIMB THE LADDER

Use the ladder to practice facts which will help you with column addition.

Think of a number from 10 to 19. Add each number on the ladder to your number. For example, 14 + 2 = 16, 14 + 5 = 19, and so on.

When you can climb the ladder quickly, choose another number and add the numbers on the ladder to your new number. Practice with all the numbers from 10 through 19.

When you can climb quickly with any number in the teens, choose a number in the twenties; then choose a number in the thirties.

UNIT TEST

Number a sheet of paper and write the answers:

1. Which number is largest?

898 1012 999 1000

2. Write the largest number you can by using each of these 3 digits once: 2, 4, and 6.

3. What two numbers come next?

60 70 80 90 ? ?

4. What number comes next?

700 800 900 ?

5. How many tens are in one hundred?

6. How many hundreds are in one thousand?

7. If you could choose from $124 in bills, would you want the amount the 1 or the 4 stands for? Why?

8. Write five hundred thirty-eight with digits.

9. Write two thousand, forty-five with digits.

10. Write nineteen hundred sixty with digits.

11. Write the number that is 10 tens.

12. Write the number that is 100 tens.

13. Write the number that means four tens and eight.

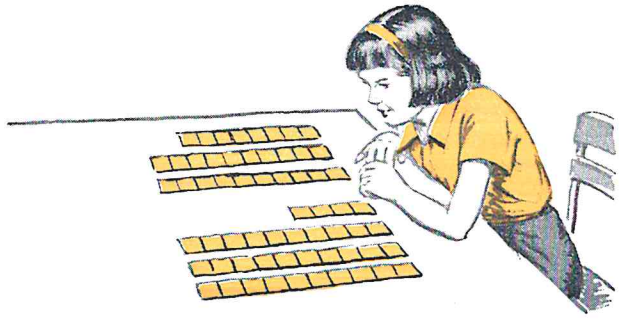
14. Write these numbers in words: 13 64 210 403

15. Which number means a score of *not any*?

16. Write the second letter of the alphabet.

17. If you subtract a number from itself, what is the answer?

18. Write the number that means 100 tens and 5 ones.



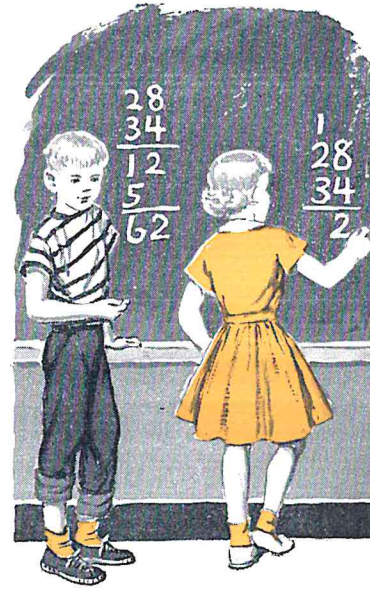
UNIT 4

CARRYING AND CHANGING BACK

PLANNING A VISIT

Two classes plan to visit a vegetable market next week. There are 28 children in one class and 34 in the other. How many children will that be all together? The teacher asked Carol to find the answer with counters.

1. Sam and Norma worked at the chalkboard. Look at their work in the picture here. How is Sam adding the ones and the tens? How is Norma adding them?



2. Is Carol's way a good one? Will she probably get the answer right?

3. Do all three children find that they have enough ones to make a ten and two ones? Norma writes 2 ones. What does she do with the ten? Does she **carry** it to **tens'** column? Where does she write it?

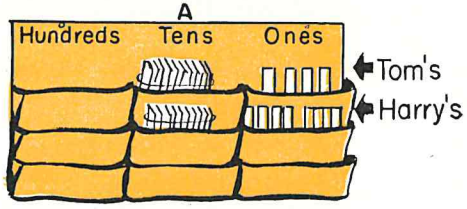
▶ ADDING HUNDREDS, TENS, AND ONES

1. Tom has 14 tickets, and Harry has 18. How many have the boys together?

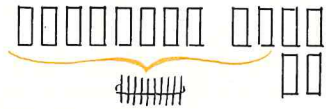
How many tens and how many ones are in Tom's row?

How many tens and how many ones are in Harry's row?

A

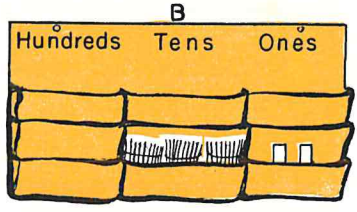


Harry will put the rows of tickets together. First he puts the 8 with the 4. He makes a bundle of 10. How many single tickets does he have left over?



Harry says, "I'll put the 2 single tickets in the ones' pocket. I'll carry the bundle of ten over to the tens' pocket." Harry then puts the bundles of tens together. The tickets look like those in *B*.

B



Do these numbers show you what Harry did?

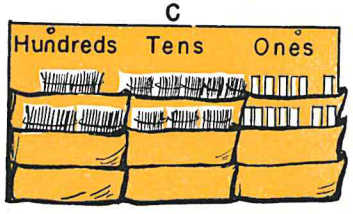
$$\begin{array}{r} {\scriptstyle 1} \\ 14 \\ 18 \\ \hline 32 \end{array}$$

2. Tell about the tickets that you see in the pockets in *C*.

How many are in each row?

If you put the rows together, how many single tickets will be in the ones' pocket after a bundle of ten is carried to the tens' pocket?

C

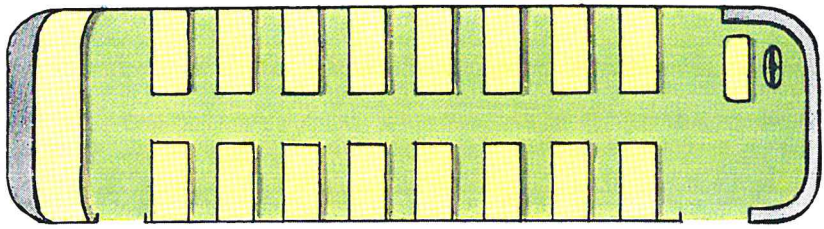


How many tens will there be all together?

How many hundreds will there be all together?

Are there 393 tickets in the pockets?

$$\begin{array}{r} {\scriptstyle 1} \\ 156 \\ 237 \\ \hline 393 \end{array}$$



THE SCHOOL BUS

1. How many seats has this school bus?

2. Two children sit in each small seat and four sit in the large rear seat. How many children can be seated in this bus?

3. Jim's school has two buses. They are called the East bus and the West bus. The East bus makes 3 trips each morning. It carries 34, 32, and 25 children on these trips. How many children does it carry on its three trips?

4. The West bus has 3 loads of 32 children each. How many does it carry?

5. One bus carries 96 pupils in 3 trips. Another bus carries 91 pupils. What is the difference?

6. The East bus goes 8 miles, 16 miles, and 17 miles. How far is that for all the trips?

7. The West bus has trips of 9 miles, 16 miles, and 13 miles. How far does it go in 3 trips?

8. The buses make the same trips in the afternoon that they make in the morning. How far does each bus go in one day?

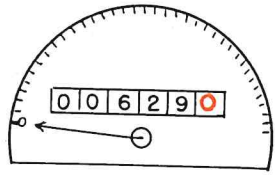
PRACTICE

Climb the ladder, page 34.

MACHINES ADD ONES, TENS, AND HUNDREDS

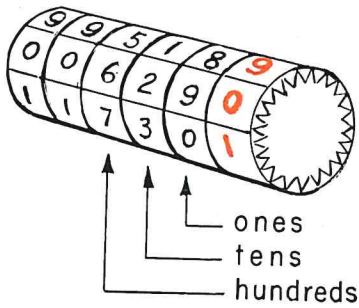
Machines count or add by changing ones, tens, and hundreds. The clerk punches different columns for dollars than he does for cents.

An automobile speedometer tells the speed and the number of miles a person goes. The part that tells the miles is called an odometer. The inside part that counts the miles has a row of wheels.



The red numbers show tenths of a mile. When the wheel with red numbers goes around once, the wheel that shows ones' place moves one number.

This car has gone 629 miles. When it goes one more mile, which numbers will come into the tens' and ones' windows?



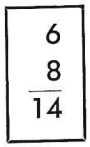
PRACTICE

Copy and add:

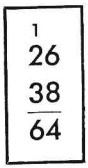
1. 48 96	**2.** 93 75	**3.** 47 85	**4.** 38 67	**5.** 76 95	**6.** 54 89
7. 39 86	**8.** 427 549	**9.** 456 327	**10.** 617 358	**11.** 219 645	**12.** 518 465
13. 969 928	**14.** 519 374	**15.** 383 609			

16. $5 + 7 + 9 + 9$
17. $8 + 8 + 4 + 3$
18. $7 + 6 + 8 + 9$

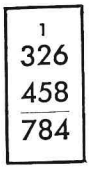
ADDITION WITH CARRYING



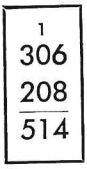
1. 6 ones and 8 ones are 14. 14 is 1 ten and 4 ones. Write the 4 in the ones' column. Write the 1 in the tens' column.



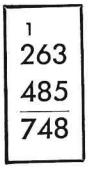
2. Now you have both ones and tens to add. You write the 4 in ones' column just as you did above. You carry the 1 ten and add it to the 2 tens and the 3 tens.



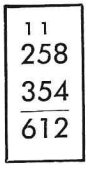
3. This time you have hundreds to add also. After you add the tens, you must add the hundreds.



4. Now there are zero tens in the tens' column. One ten and 2 zeros are 1. You write it in the tens' place.



5. 3 and 5 are 8. Is there a ten to carry? 6 tens and 8 tens are 14 tens. Write the 4 in tens' column. Carry the 1 hundred and add it with the hundreds.



6. This time you must carry to both the tens' and the hundreds' columns. Tell how the example is added.

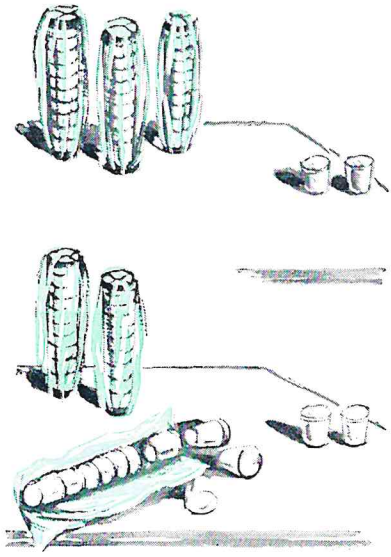
PRACTICE IN CARRYING

Add. Use folded paper.

	a	b	c	d	e	f	g
← 1.	7	9	8	5	7	8	9
	6	5	4	6	9	5	8

Copy these and add. Write the carry digits. If you need help, look across to the opposite page.

	a	b	c	d	e	f	g
← 2.	28	49	14	26	14	17	46
	36	14	68	27	79	25	48
← 3.	634	247	228	519	258	328	215
	239	228	145	467	439	267	759
← 4.	306	805	109	303	108	504	203
	309	107	708	209	406	207	308
← 5.	185	453	646	192	463	154	386
	543	264	273	776	495	473	262
← 6.	279	436	567	286	535	179	347
	468	387	258	658	397	654	589



SUBTRACTING TENS AND ONES

1. There are 32 paper cups for the party. Are there 3 packages of 10 each? Are there 2 single cups?

Jane needs 14 cups. How many will be left for Dot?

2. Tell how Jane takes 14 cups. Does she open 1 package of 10? Does she put the 10 with the 2? Can she now take 4 cups and a package of ten?

There are 32
Jane takes 14

Take one ten and put it with the 2 ones. → 2 12, 3 2
Subtract. → 1 4
Dot has left: → 1 8

3. Act the story with counters.

4. In which subtractions below will you need to change a ten to ones? Use counters to show each subtraction.

a.	**b.**	**c.**	**d.**
65	31	23	45
32	14	16	24

Copy and subtract:

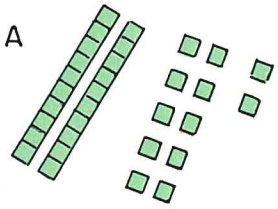
5. 52	**6.** 93	**7.** 54	**8.** 38	**9.** 82	**10.** 93
16	59	46	12	35	67
11. 93	**12.** 43	**13.** 28	**14.** 63	**15.** 91	**16.** 49
48	22	5	56	85	7
17. 82	**18.** 85	**19.** 78	**20.** 83	**21.** 64	**22.** 72
67	48	54	75	29	68

▸ CHANGING TENS TO ONES WITH COUNTERS

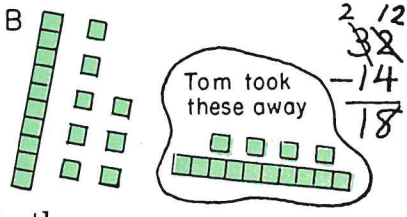
The boys and girls in Miss Adams' class use their counting squares to learn to subtract tens. They keep extra counters in THE BANK to change ones and tens and hundreds

1. How has Sandra shown 32 with her counters? How can she take 14 away from 32?

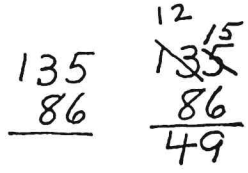
2. Tom put one of his tens in the bank and changed it for ten ones. He now has on his desk the counters in Picture *A*. Is the number still 32?



3. Picture *B* shows what Tom did. He took 4 ones. Then he took one ten. How should he write the subtraction?

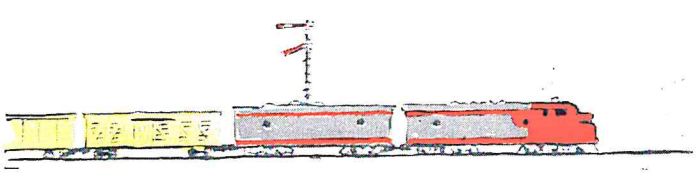


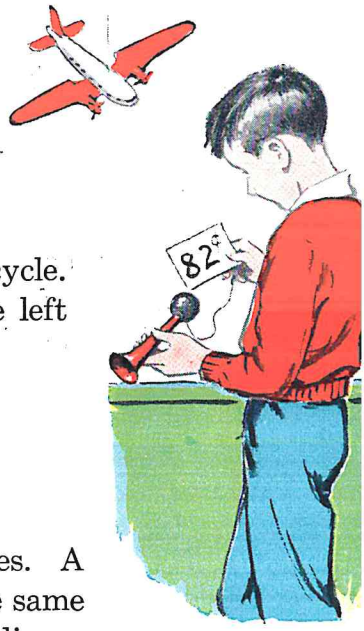
4. Joe worked the example at the right. He said, "I have 1 hundred, 3 tens, and 5 ones. The 1 hundred is 10 tens, so I have 13 tens. I can change one of these tens to ones and then I will have 12 tens and 15 ones. 6 from 15 is 9. 8 from 12 is 4."



5. Copy and subtract:

a. 144	**b.** 126	**c.** 133	**d.** 125	**e.** 163	**f.** 141
46	47	69	38	95	74





CHANGING DOLLARS TO DIMES

Jim is looking at a horn for his bicycle. He has $1.25. How much will he have left if he buys the horn which costs 82¢?

You can work it this way:

1 dollar	2 dimes	5 cents
	8 dimes	2 cents
	?	3 cents

Eight dimes are more than 2 dimes. A dollar is 10 dimes. So Jim really has the same as 10 dimes and 2 dimes, which is 12 dimes. His problem, after changing his dollar to dimes, would look like this:

	12			
~~1 dollar~~	~~2~~ dimes	5 cents		$1.25
	8 dimes	2 cents	or	.82
	4 dimes	3 cents		$ .43

4 dimes and 3 cents are 43¢.

Copy and work these examples. Change one of the dollars to dimes if you need more dimes.

	a	b	c	d	e
1.	$3.25	$4.46	$2.78	$3.17	$4.39
	−.84	−.73	−.65	−.93	−1.86
2.	$6.24	$3.18	$2.47	$1.69	$1.58
	−3.51	−2.73	−1.62	−1.34	−.76
3.	$5.36	$4.72	$5.18	$1.28	$2.40
	−2.82	−3.51	−4.50	−.96	−1.50

▶ CHANGING HUNDREDS TO TENS

1. Tom's family goes 183 miles on the first day of their trip. The total distance is 459 miles. How much farther do they need to go the next day?

Tom writes 459 miles. Under it he writes 183.

He takes 3 ones from 9 ones, but 8 tens are more than 5 tens. So he changes one hundred back to tens. He puts the 10 tens with the 5 tens.

10 tens and 5 tens are 15 tens.

8 from 15 is 7.

He next takes 1 hundred from 3 hundreds.

2. Tom checks his subtraction by adding. Does he need to carry 1 hundred to hundreds' place?

What did he need to do with a hundred in his subtraction?

A

$$\begin{array}{r} 459 \\ -183 \\ \hline \end{array}$$

B

$$\begin{array}{r} {\scriptstyle 3\,1} \\ 4\not{5}9 \\ -183 \\ \hline 276 \end{array}$$

C

$$\begin{array}{r} {\scriptstyle 1} \\ 276 \\ 183 \\ \hline 459 \end{array}$$

3. Explain each subtraction below:

a. $\begin{array}{r} {\scriptstyle 7\,14} \\ 8\not{4} \\ 59 \\ \hline 25 \end{array}$ **b.** $\begin{array}{r} {\scriptstyle 5\,13} \\ 6\not{3}7 \\ 483 \\ \hline 154 \end{array}$ **c.** $\begin{array}{r} {\scriptstyle 8\,12} \\ 9\not{2} \\ 65 \\ \hline 27 \end{array}$ **d.** $\begin{array}{r} {\scriptstyle 2\,15} \\ 1\not{3}\not{5} \\ 68 \\ \hline 67 \end{array}$ **e.** $\begin{array}{r} {\scriptstyle 7\,14} \\ 8\not{4}3 \\ 463 \\ \hline 380 \end{array}$

4. Copy and answer these subtractions. Use the small numbers if they help you change tens or hundreds.

a. 154 − 60	**b.** 436 − 272	**c.** 71 − 23	**d.** 675 − 394	**e.** 329 − 175	**f.** 636 − 246
g. 152 − 64	**h.** 141 − 85	**i.** 423 − 146	**j.** 536 − 268	**k.** 564 − 389	**l.** 774 − 498

CHANGING BACK FROM BOTH TENS AND HUNDREDS

An automobile trip is 535 miles. Barbara's family went 298 miles the first day. How many miles were left for the second day?

Tell how Barbara changes a ten to ones.

9 tens are more than 2 tens. So Barbara changes a hundred back to tens. What does she write above the hundreds? Look at *C*.

What does she write above the tens? Why?

Tell how she subtracted to finish the example.

A

535
298

B

2 15
535
298
7

C

4 12 15
535
298
237

UNIT TEST

1	2	3	4	5	6	7
36 +27	84 −69	52 −16	34 −17	38 +43	25 +67	76 −38
8	**9**	**10**	**11**	**12**	**13**	**14**
94 −35	89 +72	92 −58	85 −26	78 +69	82 −43	91 −24
15	**16**	**17**	**18**	**19**	**20**	**21**
98 −69	71 −12	497 +259	724 −298	676 −293	358 +275	752 −376
22	**23**	**24**	**25**	**26**	**27**	**28**
465 +498	572 −289	931 −545	539 +398	631 −352	828 −349	387 +545
29	**30**	**31**	**32**	**33**	**34**	**35**
923 −546	437 +286	388 +386	552 −157	275 +479	863 −469	974 −596

MEANING OF WORDS

Choose the word or words that make the best sentence. Sometimes there may be two words that nearly tie for the best answer. Answer the questions on an answer sheet first, then talk about why you chose your answer. Not all children will agree.

1. An elephant is: **a.** big **b.** large **c.** huge **d.** average for animals

2. A mouse is: **a.** small **b.** average for animals **c.** fairly large **d.** tiny

3. If Carol has a perfect lesson 4 days a week, she: **a.** seldom has a perfect lesson **b.** usually has one **c.** always has one **d.** often has one

4. If Bill wants to spend five dollars and has two dollars, he has: **a.** plenty **b.** very little **c.** nearly enough **d.** more to earn

5. If Ann goes out and Susan comes after her with no one between them, Susan comes: **a.** soon **b.** early **c.** next **d.** quickly

6. Dave has 35 cents and Don has 34 cents. The number of cents they have is: **a.** exactly the same **b.** nearly the same **c.** very different **d.** equal

7. If nobody but you has any, you have: **a.** the only one **b.** any one **c.** one, also **d.** all of them

Some names for groups are **drove, herd, gang, flock, collection, bunch, host, swarm, crowd,** and **pack.** Finish each sentence below with one of the names above:

8. Many birds are a _?_.

9. Many bees are a _?_.

10. Many cattle are a _?_.

11. Many boys are a _?_.

12. Many people are a _?_.

13. Many grapes are a _?_.

UNIT 5

MULTIPLICATION AND DIVISION
TWOS, THREES, FIVES

MULTIPLYING TWOS

1. How many couples are playing? How many children are there? Count them by twos.

2. Carl says there are many ways to write numbers to tell how many children are playing. Read his ways:

a. 2, 4, 6, 8, 10.

b. $2 + 2 + 2 + 2 + 2 = 10$.

c. 5 twos are 10.

d. 5 times 2 is 10.

3. Was Carl counting in (**a**)? Was he adding in (**b**)?

4. Carl was multiplying in (**c**) and (**d**).

5. Ann says there are shorter ways to write multiplication. She wrote it two ways. →

$5 \times 2 = 10$

$$\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$$

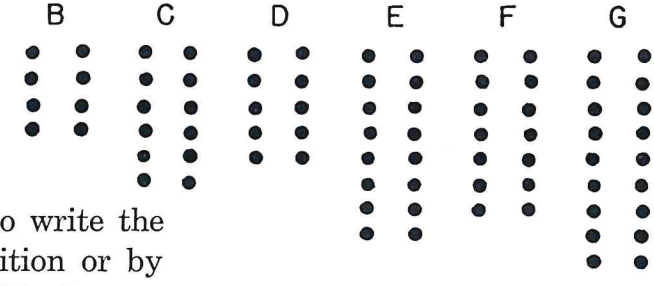
• The sign $\times$ tells you to multiply. The answer in multiplication is called the **product.**

6. Write an addition example and a multiplication example for each dot picture below. *A* is done for you.

A

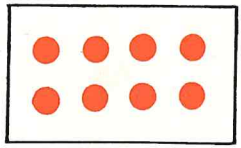
$$\begin{array}{r} 2 \\ 2 \\ +\,2 \\ \hline 6 \end{array} \qquad \begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$$

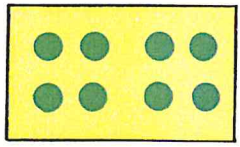
B C D E F G



Is it easier to write the examples by addition or by multiplication? Why?

TWO WAYS TO SEE GROUPS

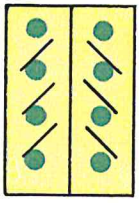


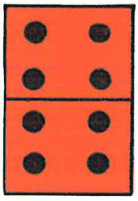


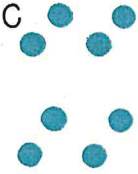
1. "Look," said Bob. "You think of these dots in two ways. You can see them as 4 twos or as 2 fours." Is Bob right?

2. Here is another way to show 8 things. Do you say "4 twos" or "2 fours"?

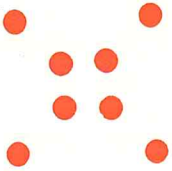
3. Tell about the groups you see in each picture below:

A 

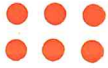
B 

C 

D

E 

4. You can tell about Group *F* by saying "2 threes" or "3 twos." What can you tell about the other groups?

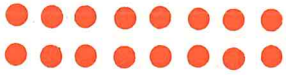
F 

I

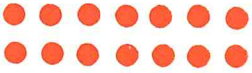
L

G

J

M 

H

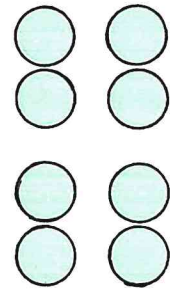
K 

PRACTICE

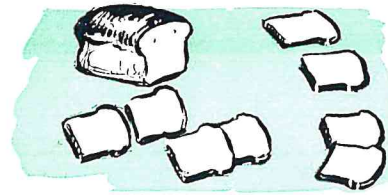
Copy and find the products:

1	2	3	4	5	6	7	8
2	2	2	2	2	2	2	2
×3	×5	×8	×6	×4	×2	×9	×7
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
4	2	5	3	7	8	6	9
×2	×2	×2	×2	×2	×2	×2	×2

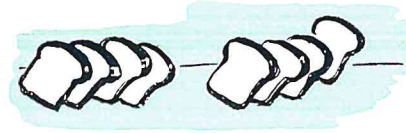
MULTIPLICATION AND DIVISION FAMILIES



1. Can you see these coins in two ways? If you think, "Two boys have 4 cents each," how do you see them? You think: $2 \times 4 = 8$. If you think, "Four boys have 2 cents each," how do you see them? You think: $4 \times 2 = 8$.



2. How many sandwiches can you make from 8 slices of bread? Each sandwich is to have 2 slices. Can you think, "How many twos in 8?" You can write, "How many twos in 8?" in two other ways, like this: $2\overline{)8}$ and $8 \div 2$. You can read them, also, as "8 divided by 2."



3. Our family eats 4 slices of bread each meal. How many meals will 8 slices serve? How many fours are there in 8? In what other ways can you ask the question?

4. Read these questions:

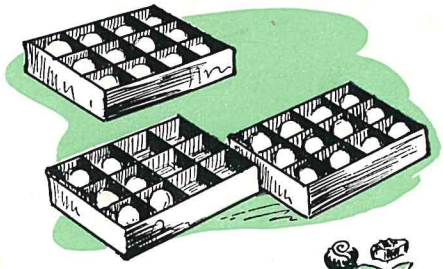
$2\overline{)8}$ $\quad$ $4\overline{)8}$ $\quad$ $\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$ $\quad$ $\begin{array}{r} 4 \\ \times 2 \\ \hline \end{array}$

The facts above are all related. When you learn one of them, you know the others. They are called the multiplication and division family of 8.

5. Use counters to find how many twos there are in 6, in 10, in 12, in 16, and in 18. Then write these families that have twos as Alice has written about the twos in 14 below:

$\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$ $\quad$ $\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array}$ $\quad$ $2\overline{)14}^{\,7}$ $\quad$ $7\overline{)14}^{\,2}$ $\quad$ $7 \times 2 = 14$ $\quad$ $14 \div 2 = 7$ $\quad$ $2 \times 7 = 14$ $\quad$ $14 \div 7 = 2$

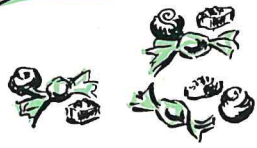
GROUPS OF THREE



1. How many eggs are in each box? How did you find out?

2. One box is only half full. How many eggs are in it?

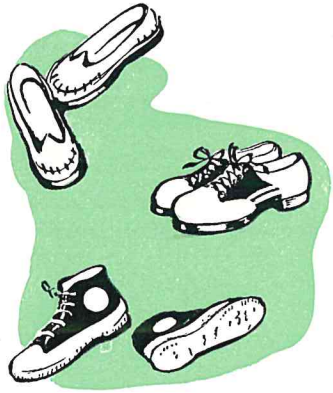
3. How many eggs are in all three boxes?



4. How many threes do you see?

5. How many are 8 threes? 6 threes?

6. Sue earned 5¢ each day for 3 days. How many cents did Sue earn?



7. Dick, Sue, and Jim each had 4 jacks. How many jacks did all three of them have?

8. Joe had 3 pairs of shoes. How many shoes did he have?

9. Dot wants to swim in the pool 3 days each week for 8 weeks. How many daily tickets will that take?

10. Count to 30 by threes.

11. Copy and find the products. Make dot pictures for the last two in the row. Are your products right?

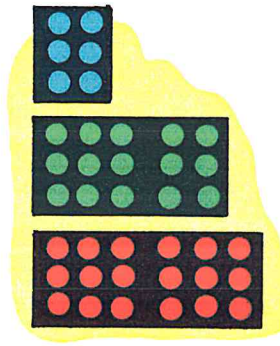
3	3	3	3	3	3	3	3	3
×1	×2	×3	×4	×5	×6	×7	×8	×9

12. Find the products:

3	3	3	3	3	3	3	3	3
×5	×8	×3	×7	×2	×9	×1	×4	×6

13. How many threes are there in 6? in 12? in 15? in 21? in 24? in 9? in 18? in 27?

EITHER WAY



1. 2 threes are ?. 3 twos are ?.
2. 5 threes are ?. 3 fives are ?.
3. 6 threes are ?. 3 sixes are ?.
4. Is the product the same either way you multiply?

> Whenever you multiply, you may say either number first. The answer is the same both ways.
> 4 twos are 8. 2 fours are 8. $4 \times 2 = 8$ $2 \times 4 = 8$

5. Copy each pair below and multiply. Then do the next pair, and so on.

a.			**b.**			**c.**			**d.**		
3	2		5	3		4	3		2	4	
×2	×3		×3	×5		×3	×4		×4	×2	

PRACTICE

How fast can you do these on a folded paper?

	a	b	c	d	e	f	g	h
1.	3 ×4	6 ×3	3 ×2	7 ×3	3 ×5	8 ×3	3 ×1	9 ×3
2.	3 ×3	3 ×7	5 ×3	3 ×9	2 ×3	3 ×6	4 ×3	3 ×8
3.	$2\overline{)4}$	$3\overline{)9}$	$2\overline{)8}$	$3\overline{)21}$	$3\overline{)6}$	$2\overline{)12}$	$2\overline{)6}$	$3\overline{)18}$
4.	$3\overline{)12}$	$2\overline{)16}$	$2\overline{)10}$	$3\overline{)27}$	$2\overline{)14}$	$3\overline{)15}$	$3\overline{)24}$	$2\overline{)18}$

THE FIVES

1. Count by fives to 50.

2. There is something interesting about the fives. How can you use tens to learn the fives?

3. Doris says, "1 ten is 2 fives. 2 tens are 4 fives. 3 tens are 6 fives. 4 tens are 8 fives. 5 tens are 10 fives."

4. Find the colored products and the black products in the table of fives. Tell why each product is ten more than the one before it of the same color.

5. If you know 6 fives, how many are 7 fives?

6. If you know 8 fives, how many are 9 fives?

$1 \times 5 = 5$	$5 \times 1 =$
$2 \times 5 = 10$	$5 \times 2 =$
$3 \times 5 = 15$	$5 \times 3 =$
$4 \times 5 = 20$	$5 \times 4 =$
$5 \times 5 = 25$	$5 \times 5 =$
$6 \times 5 = 30$	$5 \times 6 =$
$7 \times 5 = 35$	$5 \times 7 =$
$8 \times 5 = 40$	$5 \times 8 =$
$9 \times 5 = 45$	$5 \times 9 =$
$10 \times 5 = 50$	$5 \times 10 =$

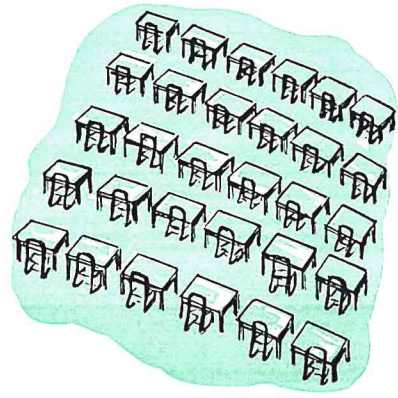
PRACTICE

Write the answers on folded paper:

	a	b	c	d	e	f	g	h
1.	5×2	5×6	5×4	5×7	5×3	5×8	5×5	5×9
2.	3×5	2×3	7×5	3×4	4×5	5×3	6×5	3×8
3.	6×3	5×5	3×4	9×5	7×3	2×5	3×9	8×5
4.	$5\overline{)20}$	$3\overline{)15}$	$5\overline{)10}$	$2\overline{)14}$	$5\overline{)25}$	$4\overline{)12}$	$5\overline{)15}$	$3\overline{)21}$
5.	$3\overline{)27}$	$5\overline{)40}$	$6\overline{)18}$	$5\overline{)35}$	$3\overline{)24}$	$5\overline{)45}$	$4\overline{)8}$	$5\overline{)30}$

PROBLEM SOLVING

How Many All Together?



1. There are 6 desks in each row in Tom's room. There are 5 rows of desks. How many desks are there all together?

How would you find out? Bill says he would count them. Jane says she would add to find out. Marie says she can get the answer by multiplying. She writes the problem on the chalkboard this way. → 6 × 5 = 30 She says, "5 rows, 6 in each row, are 5 sixes, or 30."

2. Write an example for a room with 6 chairs in each of 3 rows; in each of 2 rows; in each of 5 rows.

What you know:	The groups are equal. The number in each group. The number of groups.
What you do:	**Multiply** the number in each group by the number of groups.

How Much Do They All Cost?

3. Betty buys 6 stamps at 3¢ each. How much do they cost?

4. How much will 6 lemons cost at 5¢ each?

5. How much will 3 candy bars cost if each is 7¢?

6. What will 3 packages of gum cost at 5¢ a package?

7. What will 3 toy cars cost at 9¢ each?

8. What will 3 whistles cost at 8¢ each?

Make a rule about how to find the cost of several things when each one costs the same amount.

▶ FAMILIES OF 2'S, 3'S, AND 5'S

On page 50, you learned what a multiplication and division family is. You discovered that it is easier to learn number facts in families.

Read these families and say the missing numbers:

1	2	3	4
? × 2 = 6	? × 2 = 8	? × 2 = 10	? × 2 = 12
? × 3 = 6	? × 4 = 8	? × 5 = 10	? × 6 = 12
6 ÷ ? = 3	8 ÷ ? = 4	10 ÷ ? = 5	12 ÷ ? = 6
6 ÷ ? = 2	8 ÷ ? = 2	10 ÷ ? = 2	12 ÷ ? = 2

5	6	7	8
? × 2 = 14	? × 2 = 16	? × 2 = 18	? × 3 = 9
2 × ? = 14	? × 8 = 16	? × 9 = 18	9 ÷ ? = 3
14 ÷ ? = 7	16 ÷ ? = 8	18 ÷ 2 = ?	
14 ÷ 7 = ?	16 ÷ ? = 2	18 ÷ ? = 2	

9	10	11	12
? × 3 = 12	? × 3 = 15	? × 3 = 18	? × 3 = 21
? × 4 = 12	? × 5 = 15	? × 6 = 18	? × 7 = 21
12 ÷ 3 = ?	15 ÷ 3 = ?	18 ÷ ? = 6	21 ÷ 3 = ?
12 ÷ 4 = ?	15 ÷ 5 = ?	18 ÷ ? = 3	21 ÷ 7 = ?

13	14	15	16
? × 3 = 24	? × 3 = 27	? × 5 = 20	? × 5 = 25
? × 8 = 24	? × 9 = 27	? × 4 = 20	25 ÷ ? = 5
24 ÷ 3 = ?	27 ÷ 3 = ?	20 ÷ ? = 4	
24 ÷ 8 = ?	27 ÷ 9 = ?	20 ÷ ? = 5	

17	18	19	20
? × 5 = 30	? × 5 = 35	? × 5 = 40	? × 5 = 45
? × 6 = 30	? × 7 = 35	? × 8 = 40	? × 9 = 45
30 ÷ ? = 6	35 ÷ 5 = ?	40 ÷ ? = 8	45 ÷ 5 = ?
30 ÷ ? = 5	35 ÷ 7 = ?	40 ÷ ? = 5	45 ÷ 9 = ?

MULTIPLYING TWO-PLACE NUMBERS

1. How many are 2 ones? $2 \times 1 = 2$
How many are 2 tens? $2 \times 10 = 20$ 20 is 2 tens

2. How many are 3 ones? $3 \times 1 = 3$
How many are 3 tens? $3 \times 10 = 30$ 30 is 3 tens

3. How many are 6 twos? $6 \times 2 = 12$
How many are 6 twenties? $6 \times 20 = 120$ 120 is 12 tens

4. Tell how to do each multiplication below:

10	10	20	30	20	40	20	30
×2	×3	×6	×3	×2	×2	×8	×4

5. When you multiply 20 by 3, are there any ones? How many tens are 3 twenties? You must use a zero in ones' place so that 6 will mean tens, like this, 60.

6. Who is ahead in ringtoss? What is Mike's score? George's? Is George's score 5 × 0?

How many are 5 zeros?

7. How many is 2 × 0? 8 × 0? any number × 0?

MIKE	GEORGE
1	0
2	0
0	0
0	0
1	0

8. What is the cost of 2 sundaes at 34¢ each?

34¢
2
68¢

Two fours are 8. Why is the 8 written in the ones' place?

Two threes are 6. Does the 3 stand for tens? Why is the 6 written in tens' place?

The two sundaes cost 68¢.

- You first multiply the ones, and then the tens.

9. Multiply these examples:

42	34	30	93	31	70	82	50
3	2	3	2	5	2	3	5

MULTIPLYING THREE-PLACE NUMBERS

- A **two-place** whole number has tens and ones.
- A **three-place** whole number has hundreds, tens, and ones.

1. Read the numbers below that are three-place numbers. Then read the two-place numbers.

642 581 27 96 134 8 204 60 340

- You multiply three-place numbers in the same way that you multiply two-place numbers.

You first multiply the ones.
Then multiply the tens.
Then multiply the hundreds.

$$\begin{array}{r} 234 \\ \times\ 2 \\ \hline 8 \end{array} \qquad \begin{array}{r} 234 \\ \times\ 2 \\ \hline 68 \end{array} \qquad \begin{array}{r} 234 \\ \times\ 2 \\ \hline 468 \end{array}$$

2. Tell what happened in these multiplications:

$$\begin{array}{r} 200 \\ \times\ 3 \\ \hline 600 \end{array} \quad \begin{array}{r} 201 \\ \times\ 3 \\ \hline 603 \end{array} \quad \begin{array}{r} 231 \\ \times\ 3 \\ \hline 693 \end{array} \quad \begin{array}{r} 400 \\ \times\ 3 \\ \hline 1200 \end{array} \quad \begin{array}{r} 402 \\ \times\ 3 \\ \hline 1206 \end{array} \quad \begin{array}{r} 412 \\ \times\ 3 \\ \hline 1236 \end{array}$$

PRACTICE

Multiply:

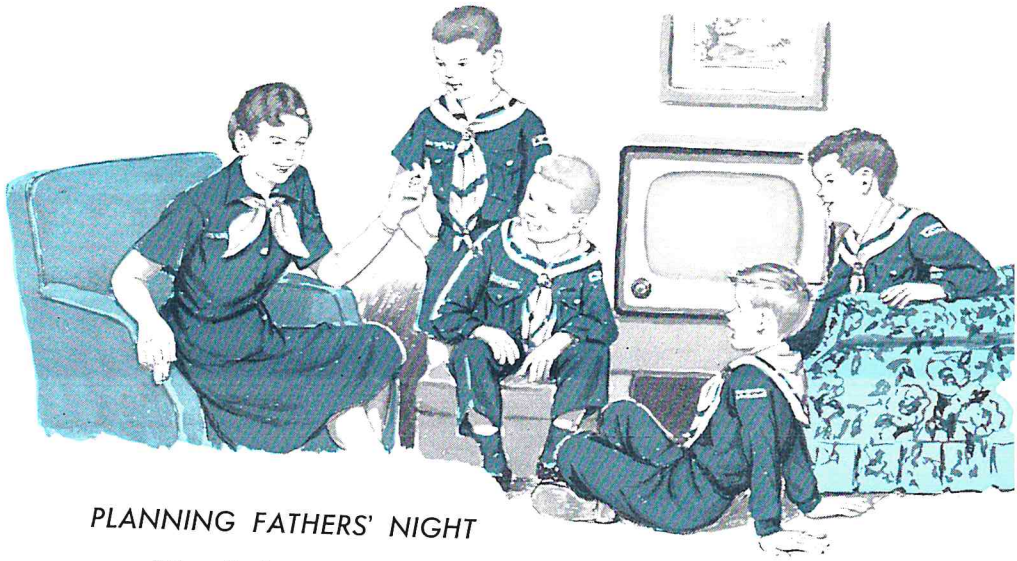
1. $\begin{array}{r} 20 \\ \times\ 3 \\ \hline \end{array}$ **2.** $\begin{array}{r} 300 \\ \times\ 2 \\ \hline \end{array}$ **3.** $\begin{array}{r} 32 \\ \times\ 3 \\ \hline \end{array}$ **4.** $\begin{array}{r} 312 \\ \times\ 3 \\ \hline \end{array}$ **5.** $\begin{array}{r} 42 \\ \times\ 2 \\ \hline \end{array}$ **6.** $\begin{array}{r} 30 \\ \times\ 3 \\ \hline \end{array}$

7. $\begin{array}{r} 60 \\ \times\ 3 \\ \hline \end{array}$ **8.** $\begin{array}{r} 500 \\ \times\ 5 \\ \hline \end{array}$ **9.** $\begin{array}{r} 43 \\ \times\ 3 \\ \hline \end{array}$ **10.** $\begin{array}{r} 823 \\ \times\ 2 \\ \hline \end{array}$ **11.** $\begin{array}{r} 81 \\ \times\ 3 \\ \hline \end{array}$ **12.** $\begin{array}{r} 90 \\ \times\ 5 \\ \hline \end{array}$

13. $\begin{array}{r} 41 \\ \times\ 5 \\ \hline \end{array}$ **14.** $\begin{array}{r} 523 \\ \times\ 2 \\ \hline \end{array}$ **15.** $\begin{array}{r} 402 \\ \times\ 3 \\ \hline \end{array}$ **16.** $\begin{array}{r} 340 \\ \times\ 2 \\ \hline \end{array}$ **17.** $\begin{array}{r} 620 \\ \times\ 3 \\ \hline \end{array}$ **18.** $\begin{array}{r} 530 \\ \times\ 2 \\ \hline \end{array}$

Watch the signs:

19. $\begin{array}{r} 164 \\ -\ 86 \\ \hline \end{array}$ **20.** $\begin{array}{r} 846 \\ -289 \\ \hline \end{array}$ **21.** $29 + 173 + 8$ **22.** $8 + 9 + 7 + 9$



PLANNING FATHERS' NIGHT

The Cub Scout Dens in Bill's church meet together next week. The Scouts' fathers will come, too. Forty people in all are expected to come. The Scouts will cook hamburgers. How many buns will they need?

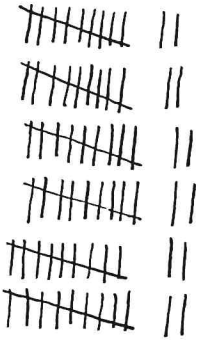
"I think 6 dozen buns will do," said Bill. How many are 6 dozen? How would you find out?

Tell what each person did in these four ways of finding the number of buns:

BILL'S WAY

12
12
12
12
12
12
72

JOE'S WAY



JIM'S WAY

$$\begin{array}{r} 12 \\ \times\ 6 \\ \hline 12 \\ 6 \\ \hline 72 \end{array}$$

The Den Mother showed them this way:

$$\begin{array}{r} {\scriptstyle 1} \\ 12 \\ 6 \\ \hline 72 \end{array}$$

Do they all get the same answer? Which way is quickest? Can you tell what the Den Mother did?

THINKING ABOUT MULTIPLICATION

1. Mrs. Monroe is sending cookies to Barbara's room. "I'll bake 48 cookies at a time. I'll bake 3 times," said Mrs. Monroe. How many cookies will that be?

Barbara adds three 48's.

Her mother shows her an easier way. She says to multiply 3×48.

Look at her multiplication. 3×8 is 24. Now she multiplies 3×4 and adds to the 12 the 2. Will both get the same answer?

$$\begin{array}{r} {\scriptstyle 2}\\ 48\\ 48\\ \underline{48}\\ 144 \end{array} \qquad \begin{array}{r} {\scriptstyle 2}\\ 48\\ \times 3\\ \hline 4 \end{array}$$

2. Is carrying in multiplication like carrying in addition? Look at these examples:

In the addition example you add 1 to a 2 which you see.

In the multiplication example you add 1 to a 6 which you do not see. Finish the examples.

$$\begin{array}{r} {\scriptstyle 1}\\ 25\\ 25\\ \underline{25}\\ 5 \end{array} \qquad \begin{array}{r} {\scriptstyle 1}\\ 25\\ \times 3\\ \hline 5 \end{array}$$

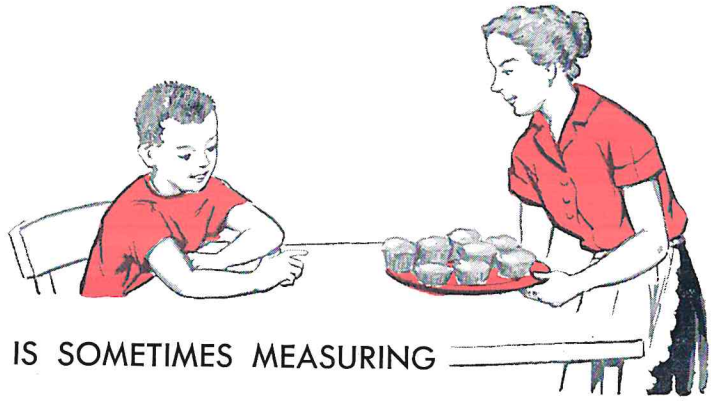
3. Do these examples. Tell how carrying in multiplication is like carrying in addition and how it is different.

$$\begin{array}{r} 34\\ 18\\ \underline{24} \end{array} \qquad \begin{array}{r} 35\\ \times 5 \end{array} \qquad \begin{array}{r} 96\\ 32\\ \underline{23} \end{array} \qquad \begin{array}{r} 56\\ \underline{3} \end{array}$$

PRACTICE

Copy these examples and multiply:

1. 12 × 8	**2.** 20 × 3	**3.** 23 × 4	**4.** 15 × 6	**5.** 27 × 3	**6.** 14 × 5	**7.** 15 × 3
8. 15 × 7	**9.** 48 × 3	**10.** 60 × 5	**11.** 12 × 7	**12.** 39 × 3	**13.** 23 × 6	**14.** 25 × 9
15. 24 × 5	**16.** 35 × 8	**17.** 36 × 3	**18.** 53 × 5	**19.** 15 × 4	**20.** 29 × 5	**21.** 87 × 5



DIVIDING IS SOMETIMES MEASURING

```
  8
−2 √
  6
−2 √
  4
−2 √
  2
−2 √ ←
  0
```

1. Tom's mother has a plate of 8 cupcakes. How many boys can have 2 cakes each? Take away as many twos as you can.

How many twos can you take? This is a way of measuring 8 by 2. Can two cupcakes be taken four times?

At the left is a long way to show how to take 2 from 8 four times.

There is a short way to write what you have done. Write 8. Now divide by 2. Write 4 above the 8.

```
   4
→ 2)8
```

Here are two ways to write 8 divided by 2:

$$8 \div 2 = \qquad 2\overline{)8}$$

The second way is the one that is used most often.

2. Write these examples both ways, as $10 \div 2$ and $2\overline{)10}$:

a. 10 divided by 2
b. 8 divided into groups of four
c. 12 divided by 3
d. How many pairs in 6?
e. 14 divided into groups of 2
f. 15 divided by 5

SAYING AND WRITING DIVISION

Here are three ways to write the same division. Read each way and say the answer:

1.	How many 2's in 4?	$4 \div 2 =$	$2\overline{)4}$
2.	How many 2's in 6?	$6 \div 2 =$	$2\overline{)6}$
3.	How many 3's in 6?	$6 \div 3 =$	$3\overline{)6}$
4.	How many 2's in 8?	$8 \div 2 =$	$2\overline{)8}$

• The answer in division is called the **quotient.**

Write the quotients on folded paper:

	a	b	c	d	e
5.	$6 \div 2$	$15 \div 5$	$21 \div 3$	$30 \div 5$	$12 \div 2$
6.	$9 \div 3$	$10 \div 2$	$20 \div 5$	$14 \div 2$	$9 \div 3$
7.	$8 \div 2$	$6 \div 3$	$18 \div 3$	$20 \div 5$	$45 \div 5$
8.	$12 \div 3$	$10 \div 5$	$25 \div 5$	$40 \div 5$	$12 \div 3$
9.	$4 \div 2$	$14 \div 2$	$35 \div 5$	$16 \div 2$	$27 \div 3$
10.	$15 \div 3$	$18 \div 3$	$27 \div 3$	$24 \div 3$	$18 \div 2$
11.	$12 \div 2$	$45 \div 5$	$21 \div 3$	$15 \div 3$	$35 \div 5$
12.	$16 \div 2$	$18 \div 2$	$25 \div 5$	$30 \div 5$	$24 \div 3$

Write the products on folded paper:

	a	b	c	d	e	f	g	h	i	j
13.	2	4	3	5	5	3	2	5	2	4
	6	5	3	6	3	4	3	4	2	3
14.	9	7	6	9	8	5	3	5	3	5
	2	5	3	3	2	7	8	5	7	8
15.	8	3	7	8	5	6	2	9	2	7
	5	9	2	3	9	5	7	5	8	3

DIVIDING IS SOMETIMES MAKING EQUAL PARTS

"The cake will have to last for two meals," said Jane's mother. "Cut it in the middle."

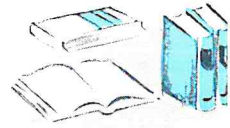
"That looks about right," said Jane. Then she cut it into halves.

1. How could Jane be sure of the middle of a round cake?

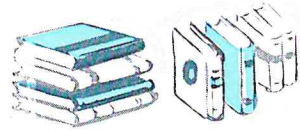
2. If the cake were 8 inches across, where would the middle be? Where would it be for a 10-inch cake? a 12-inch cake? a 16-inch cake?

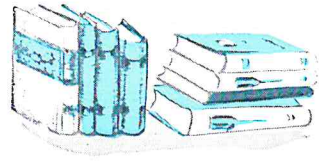
3. If we have a cake 12 inches long, where could it be cut for equal parts for 3 meals?

4. There are 6 apples in a basket. If they are divided among 3 boys, how many will each one get? We say, "6 divided by 3 is 2."



5. There are 20 new books for 5 rooms. Each room is to have an equal number of books. How many can each room have?





There are 20 books.	→	20
Give each room 1 book.		−5 √
That leaves	→	15
Give each room another book.		−5 √
That leaves	→	10
Give each room 1 more book.		−5 √
That leaves	→	5
We can give another one to each.		−5 √
We have none left.	→	0

Did each room get 4 books for its share?

A short way to make equal parts:

$$5\overline{)20}\quad 4$$

$$\underline{20}$$

▶ TERMS IN MULTIPLICATION AND DIVISION

You have learned some of the terms for addition and subtraction. Do you know these?

$$\begin{array}{r} 6 \\ 2 \\ +4 \\ \hline 12 \end{array}$$ addends, sum

$$\begin{array}{r} 125 \\ -72 \\ \hline 53 \end{array}$$ minuend, subtrahend, difference, or remainder

Multiplication and division have terms, too.

$$\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$$ multiplicand, multiplier, product

$$\text{divisor } 3\overline{)12} \quad 4 \text{ quotient, dividend}$$

1. How much will it cost Martha's mother to buy 5 ice-cream sodas at 15¢ each?

$$\begin{array}{r} 15 \\ \times 5 \\ \hline \end{array}$$

Which number is the multiplicand? the multiplier?

What will the product be?

2. Three boys picked up some big pine cones in the mountains. Each had 18 cones. How many did all of the boys get?

What number is the multiplicand? the multiplier?

What is the product?

- The number which is divided is the *dividend.*
- The number that divides it is the *divisor.*
- The answer in division is the *quotient.*

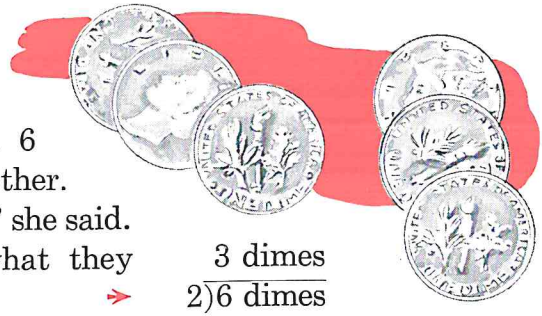
3. Bob has 18 stamps to put on 3 pages. What will be an equal number for each page?

Which number is the dividend? the divisor?

What will the quotient be?

4. There are 15 candies. How many children can have 3 candies each? What is the dividend? the divisor? What will the quotient be?

DIVIDING TENS



1. Carol's mother had 6 dimes for Carol and her brother. "We'll divide them equally," she said. Here is a way to write what they did.

$$2\overline{)6 \text{ dimes}} \rightarrow 3 \text{ dimes}$$

2. Suppose the dimes were changed to cents. How many cents are there in 6 dimes? An easy way to divide cents is to make piles of ten each. 6 tens divided by 2 is 3 tens. You can write it two ways:

$$2\overline{)6 \text{ tens}} \quad 3 \text{ tens} \qquad 2\overline{)60} \quad 30$$

Each way really stands for the same idea.

3. Divide:

$2\overline{)4 \text{ tens}}$ $3\overline{)60}$ $2\overline{)20}$ $4\overline{)80}$ $3\overline{)90}$ $2\overline{)80}$

Be sure to put the tens in tens' place.

4. How do you write 12 tens? 16 tens? 15 tens? Zeros are put in ones' place to show that the other digits mean tens. Tell how to do these divisions:

$2\overline{)12 \text{ tens}}$ $\quad 6 \text{ tens}$ $2\overline{)160}$ $\quad 80$ $5\overline{)150}$ $2\overline{)140}$ $3\overline{)120}$ $4\overline{)120}$

Copy and divide these. Write the digits of the quotients in the correct places.

	a	b	c	d	e	f
5.	$2\overline{)6 \text{ tens}}$	$3\overline{)90}$	$5\overline{)100}$	$2\overline{)40}$	$4\overline{)80}$	$3\overline{)60}$
6.	$3\overline{)12 \text{ tens}}$	$2\overline{)80}$	$4\overline{)120}$	$3\overline{)150}$	$2\overline{)100}$	$5\overline{)150}$
7.	$2\overline{)16 \text{ tens}}$	$3\overline{)210}$	$5\overline{)250}$	$2\overline{)140}$	$3\overline{)180}$	$2\overline{)20}$
8.	$3\overline{)24 \text{ tens}}$	$2\overline{)180}$	$2\overline{)120}$	$3\overline{)270}$	$6\overline{)120}$	$8\overline{)240}$

PROBLEMS WITH TENS

1. Ruth's book has 160 pages. She has read 70 pages. How many are left to read?

2. Ruth must finish reading 90 pages in 3 days. About how many pages is that for each day if she reads nearly the same number every day? Do people usually read exactly the same number of pages every day?

3. Larry has 120 pages to read in 4 days. How many should he read each day? Could he read more on some days and fewer on other days?

4. Paul says he reads about 50 pages in one evening if the book is interesting. How many pages would he read in 6 evenings at that rate?

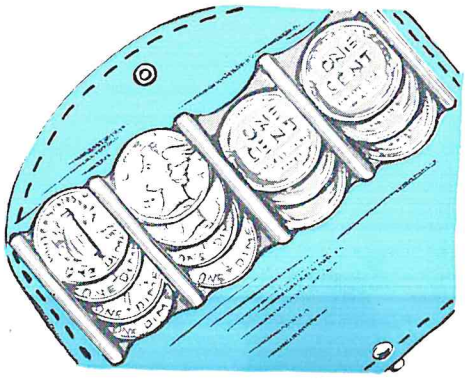
5. Grace has a set of 6 books. Each book has about 200 pages. About how many pages are there in the whole set?

6. A package of paper has 500 sheets. Will this be enough to give 90 children 5 sheets each?

7. Is a package of 500 sheets enough to make 8 piles of 70 sheets each?

8. Why do you read some pages faster than other pages? Are arithmetic pages read quickly or slowly? How rapidly are cowboy stories read?

Time yourself tonight to find the number of pages you read in ten minutes. Will it take longer to read pages in some books than in other books?



▶ DIVIDING TENS AND ONES

Jane's mother has 8 dimes and 6 cents to divide equally between Jane and her smaller brother. How many will each one get?

- Tens and ones are divided the same way.

$$\begin{array}{r} 4 \text{ dimes } 3 \text{ cents} \\ 2\overline{)8 \text{ dimes } 6 \text{ cents}} \end{array}$$

$$\begin{array}{r} 4 \text{ tens } 3 \text{ ones} \\ 2\overline{)8 \text{ tens } 6 \text{ ones}} \end{array} \qquad \begin{array}{r} 43 \\ 2\overline{)86} \end{array} \qquad \begin{array}{r} 6 \text{ tens } 4 \text{ ones} \\ 2\overline{)12 \text{ tens } 8 \text{ ones}} \end{array} \qquad \begin{array}{r} 64 \\ 2\overline{)128} \end{array}$$

- First you divide the tens in a number. Then you divide the ones.

$$\begin{array}{r} 23 \\ 3\overline{)69} \end{array}$$

PRACTICE

Copy and divide:

1	2	3	4	5	6
$2\overline{)42}$	$3\overline{)63}$	$4\overline{)48}$	$5\overline{)155}$	$3\overline{)96}$	$2\overline{)64}$
7	8	9	10	11	12
$4\overline{)128}$	$5\overline{)150}$	$3\overline{)189}$	$2\overline{)168}$	$5\overline{)105}$	$2\overline{)86}$
13	14	15	16	17	18
$3\overline{)156}$	$2\overline{)104}$	$4\overline{)84}$	$3\overline{)216}$	$4\overline{)120}$	$2\overline{)146}$
19	20	21	22	23	24
$5\overline{)150}$	$6\overline{)120}$	$3\overline{)249}$	$4\overline{)204}$	$3\overline{)210}$	$2\overline{)188}$
25	26	27	28	29	30
$8\overline{)160}$	$3\overline{)240}$	$7\overline{)140}$	$9\overline{)180}$	$3\overline{)273}$	$6\overline{)180}$

USING WHAT YOU KNOW

Set 1

You have learned how to carry to tens' place when there is a two-place multiplicand. Tell how Example *A* is multiplied.

A	*B*
$\overset{1}{24}$	124
$\times\ 4$	$\times\ 4$
96	

Tell how Example *B* is different from Example *A*.

Tell how to multiply Example *B*.

In which examples below will you need to carry to tens' place? Copy the examples and write the products.

1. 324 × 3	**2.** 213 × 7	**3.** 512 × 6	**4.** 615 × 5	**5.** 501 × 7
6. 429 × 2	**7.** 816 × 3	**8.** 301 × 9	**9.** 315 × 4	**10.** 138 × 2
11. 519 × 3	**12.** 310 × 8	**13.** 819 × 5	**14.** 315 × 6	**15.** 927 × 3

Set 2

Copy the examples below and write the quotients:

1	2	3	4	5	6
$2\overline{)68}$	$5\overline{)150}$	$3\overline{)96}$	$4\overline{)168}$	$2\overline{)102}$	$3\overline{)120}$
7	**8**	**9**	**10**	**11**	**12**
$4\overline{)200}$	$7\overline{)217}$	$3\overline{)240}$	$9\overline{)459}$	$5\overline{)405}$	$2\overline{)188}$
13	**14**	**15**	**16**	**17**	**18**
$6\overline{)120}$	$3\overline{)189}$	$4\overline{)124}$	$3\overline{)276}$	$7\overline{)140}$	$8\overline{)168}$

PRACTICE

Climb the ladder, page 34.

HALLOWEEN

Each year Pine School has a Halloween party. Each room is decorated. Then the children march through the rooms. After the parade, the mothers serve cookies and ice cream.

1. How many black cats can Bob and Betty make to decorate their room? They have 14 sheets of paper. They can make 2 black cats out of each sheet.

2. How much money did John and Dick spend? They bought 5 pumpkins to make jack-o'-lanterns. The pumpkins cost 31¢ each.

3. Mary's mother will bake 3 cookies for each child in one fourth grade classroom. There are 32 children in the room. How many cookies will Mary's mother bake?

4. Bob bought a mask for himself and one for his little sister. They cost 69¢ each. How much did both cost?

5. Jane is making a witch's costume. She spent 37¢ for crepe paper, 10¢ for thread, 25¢ for a face, and 27¢ for a witch's hat. How much did she spend for the costume?

6. John paid 32¢ for a clown face and 41¢ for buttons for his costume. How much did he spend for all of them?

7. Linda's mask cost 59¢. She gave the clerk 75¢. How much change did she get back?

THE PARADE

1. There are 15 classes in the school. Every 30 minutes $\frac{1}{3}$ of the classes will march through the rooms. How many classes is $\frac{1}{3}$ of 15 classes? $3\overline{)15}$

2. Five classes marching is a long line of Halloweeners. In one line there will be groups of 36, 35, 32, 30, and 34 children. How many children will be in this line?

3. It takes 1 hour and 30 minutes for 15 classes to parade. What time will they be through if they start at 1 o'clock?

Betty has planned these riddles for her room. Can you guess them?

A. Something that has three feet but cannot walk.

B. What is the difference between a new nickel and an old dime?

4. Do Set 1 and Set 2 on page 70.

Answers: A. A yard B. Five cents

PRACTICE

Set 1. Multiplication

	a	b	c	d	e	f	g
1.	42 × 3	51 × 5	64 × 2	73 × 3	93 × 2	91 × 5	83 × 3
2.	86 × 5	64 × 3	86 × 2	97 × 3	69 × 5	85 × 3	73 × 5
3.	415 × 5	127 × 2	519 × 3	810 × 5	326 × 3	517 × 5	540 × 2

Set 2. Division

1.	$2\overline{)180}$	$3\overline{)93}$	$5\overline{)250}$	$3\overline{)240}$	$2\overline{)140}$	$5\overline{)355}$	$2\overline{)108}$
2.	$3\overline{)330}$	$5\overline{)450}$	$2\overline{)64}$	$5\overline{)300}$	$3\overline{)159}$	$2\overline{)120}$	$3\overline{)270}$

Set 3. Addition

	a	b	c	d	e	f	g
1.	246 + 446	342 + 328	158 + 718	169 + 412	393 + 296	284 + 235	275 + 316
2.	343 + 476	166 + 574	249 + 453	679 + 245	137 + 686	329 + 374	428 + 396
3.	285 + 567	558 + 379	157 + 798	588 + 285	348 + 697	686 + 578	347 + 989

Set 4. Subtraction

1.	733 − 186	922 − 795	794 − 598	724 − 475	636 − 337	925 − 289	923 − 649
2.	884 − 489	835 − 276	863 − 575	545 − 378	823 − 334	984 − 596	746 − 289

UNIT TEST

1. Which number in Example *A* is the product? **2.** The multiplicand? **3.** The multiplier? **4.** Which number in Example *B* is the dividend? **5.** The quotient? **6.** The divisor?

A
$$\begin{array}{r} 46 \\ \times 3 \\ \hline 138 \end{array}$$

B $5\overline{)40}$ 8

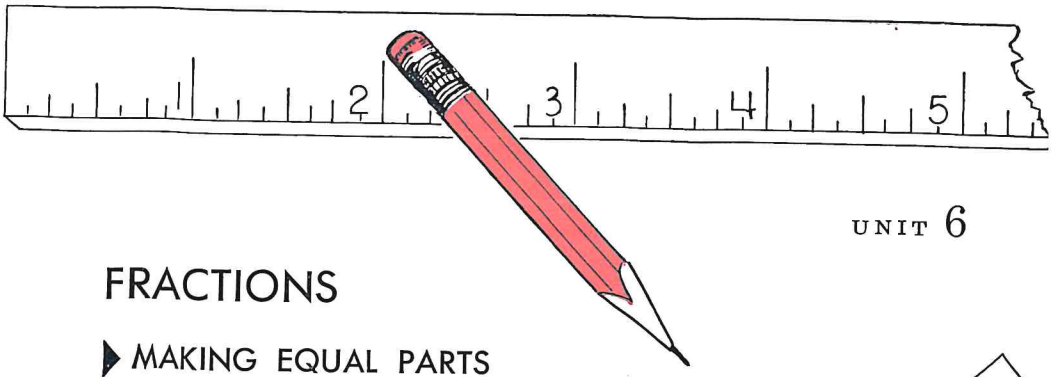
Copy and answer:

7. 5×25	**15.** $9\overline{)45}$	**23.** 3×821	**31.** $2\overline{)160}$
8. 3×46	**16.** $3\overline{)24}$	**24.** 2×147	**32.** $3\overline{)270}$
9. 2×75	**17.** $5\overline{)45}$	**25.** 5×910	**33.** $5\overline{)350}$
10. 7×32	**18.** $6\overline{)18}$	**26.** 2×439	**34.** $2\overline{)148}$
11. 4×53	**19.** $8\overline{)40}$	**27.** 3×326	**35.** $3\overline{)156}$
12. 3×79	**20.** $7\overline{)21}$	**28.** 5×117	**36.** $4\overline{)128}$
13. 2×84	**21.** $2\overline{)48}$	**29.** 3×702	**37.** $9\overline{)189}$
14. 5×96	**22.** $3\overline{)69}$	**30.** 2×348	**38.** $7\overline{)217}$

GROWTH TEST

Watch the signs.

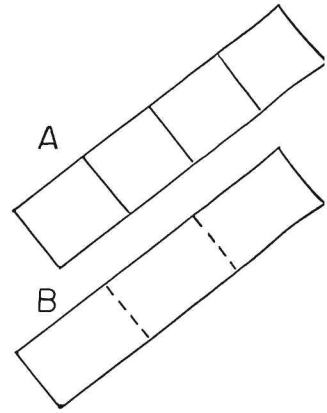
	a	b	c	d	e
1.	$\begin{array}{r} 46 \\ +52 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ +54 \\ \hline \end{array}$	$\begin{array}{r} 79 \\ -53 \\ \hline \end{array}$	$\begin{array}{r} 438 \\ +251 \\ \hline \end{array}$	$\begin{array}{r} 162 \\ -82 \\ \hline \end{array}$
2.	$\begin{array}{r} 57 \\ -30 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$	$3\overline{)15}$	$\begin{array}{r} 196 \\ -71 \\ \hline \end{array}$	$23 + 433$
3.	$25 \div 5 =$	$\begin{array}{r} 519 \\ +265 \\ \hline \end{array}$	$6 \times 3 =$	$\begin{array}{r} 791 \\ -324 \\ \hline \end{array}$	$\begin{array}{r} 21 \\ \times 7 \\ \hline \end{array}$
4.	$2\overline{)80}$	$\begin{array}{r} 176 \\ +549 \\ \hline \end{array}$	$\begin{array}{r} 723 \\ -286 \\ \hline \end{array}$	$\begin{array}{r} 42 \\ \times 5 \\ \hline \end{array}$	$4\overline{)128}$



UNIT 6

FRACTIONS

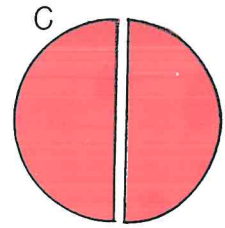
MAKING EQUAL PARTS



1. Cut 2 strips of paper 9 inches long and 2 inches wide. Use your ruler to measure them.

a. Fold one strip in the middle. Fold it again in the middle. Unfold it. How many parts do you see? Does it look like *A*? Each of 4 equal parts is called **one fourth.** It is written $\frac{1}{4}$.

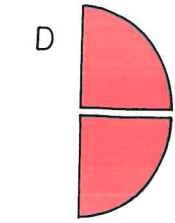
b. Draw lines on the other piece 3 inches from each end. How many parts has this piece? What is each part called? Read this: $\frac{1}{3}$.



2. Cut a paper circle into two equal parts. Is each part one half? Read: $\frac{1}{2}$.

3. Cut one of the halves into two equal parts. What is each part called?

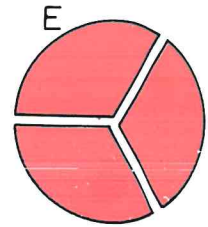
One half equals how many fourths?



4. One whole thing has how many fourths? thirds? fifths?

5. Cut a circle into thirds. Is it hard to get them equal?

6. What is $\frac{1}{4}$ of a dollar called? It is not a fourth in size, but it is $\frac{1}{4}$ of a dollar in value.



7. What other fractions of things do you know about?

TELLING ABOUT EQUAL PARTS

1. When something that is a whole is divided into 2 equal parts, what is each part called?

2. Each of 3 equal parts is called a ___?___.

3. Each of 4 equal parts is called a ___?___.

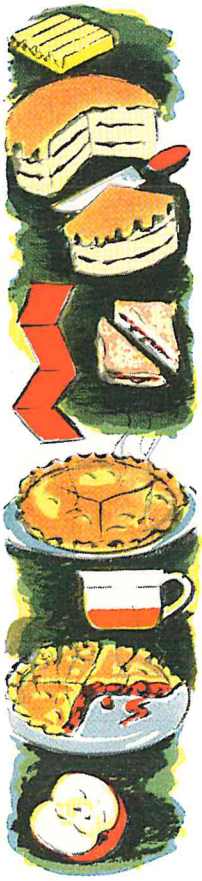
A fourth is sometimes called a **quarter.**

Equal parts are called **fractions.** Write them this way:

one half $\frac{1}{2}$	one fourth $\frac{1}{4}$
one third $\frac{1}{3}$	one fifth $\frac{1}{5}$

4. Write one sixth; one eighth; one tenth.

5. Here are some things divided into parts. Choose the right answer for each question. Use the picture at the left.



A. The butter is divided into ___?___. halves or fourths?

B. The cake is cut into ___?___. halves or thirds?

C. The sandwich is cut into ___?___. halves or quarters?

D. The paper is folded into ___?___. thirds or fourths?

E. The size of a piece of pie is ___?___. $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

F. How full is the cup? $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

G. What part of the pie is gone? $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

H. What part of an apple is this? $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

SIZE OF PARTS

1. Into how many equal parts should you cut a pie to serve 4 people? What is each part called?

2. If a pie is cut into fifths, how many parts will there be?

3. If you want $\frac{1}{2}$ of an apple, you divide it into how many equal parts?

4. Which is bigger, $\frac{1}{2}$ of a cantaloupe or $\frac{1}{2}$ of an orange?

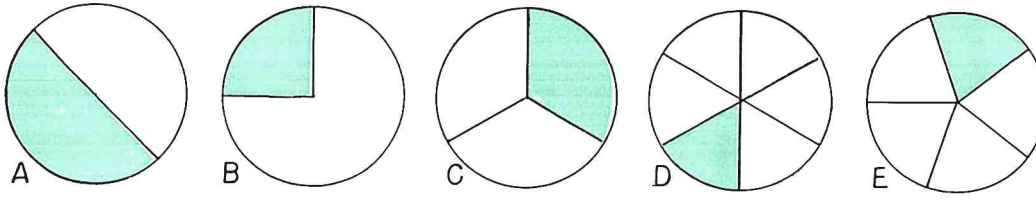
5. How many quarters are there in a whole apple?

6. Which is worth more, a quarter of a dollar or a half dollar?

7. Which one of the digits in a fraction tells the size of the part? Is it above the line or below the line?

$\frac{1}{4}$ $\frac{1}{3}$ $\frac{1}{2}$ $\frac{1}{6}$ $\frac{1}{5}$

8. Name the size of the parts below that are colored. Write the fraction that shows the size of each colored part.

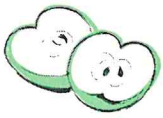


Which part is biggest? Which part is smallest?

9. Cut circles into halves, thirds, and fourths. Use numbers to write the name on each part.

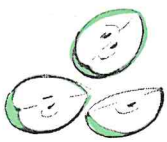
Dick has a stick of candy. He wants to break it into thirds. How many times will he need to break it?

10. There is one big apple to divide between two children. Dot's mother has a knife ready to cut it. The pieces will look like this.

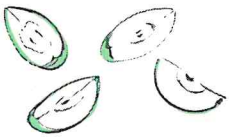


Each child will get one half.

a. Before the apple is cut, George comes in. "I'll have to cut it into three parts," says Mother. What part will each child get?



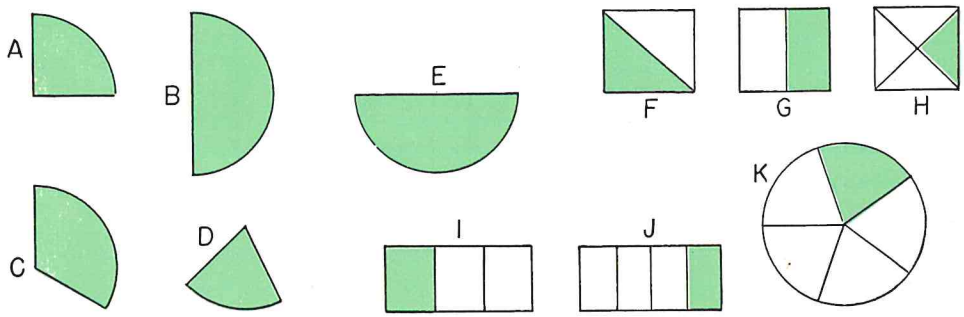
b. If another child comes in to make four children, Mother will cut the apple like this. What part will each child get?



c. As the number of children gets larger, what happens to the size of the parts of the apple?

11. Which is bigger, $\frac{1}{2}$ or $\frac{1}{4}$? $\frac{1}{3}$ or $\frac{1}{4}$? Which number shows the size of the part?

12. What size is each part that is colored? Write the fraction that tells the size.



PARTS OF A GROUP OF THINGS

1. "Earl," said Mother, "there are 6 cookies. You and Linda may each take half of them."

a. How many can each one take?

b. How do you get the answer? Do you divide 6 by 2?

The 2 in $\frac{1}{2}$ tells that a thing or a group is divided into 2 parts. To take $\frac{1}{2}$, you divide by 2.

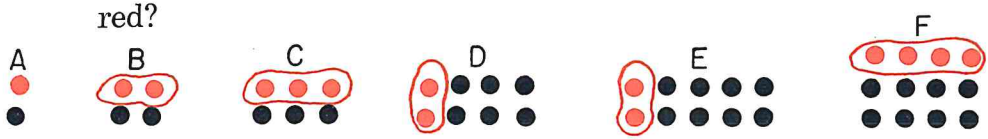
2. Mother has 6 pieces of candy for 3 children. Each takes his equal share which is $\frac{1}{3}$ of the candy.

$\frac{1}{3}$ of 6 is ? $3\overline{)6}$

3. Put 9 counters on your desk. Divide them into 3 equal groups. $\frac{1}{3}$ of 9 is _?_.

4. Divide 8 counters into fourths. $\frac{1}{4}$ of 8 is _?_. Divide 10 into halves; 12 into fourths.

5. What fraction of the dots in each group below is red?



Use numbers to tell about each group above, like this:

A. $\frac{1}{2}$ of 2 is 1. *B.* $\frac{1}{2}$ of 4 is _?_. Do C, D, E, and F.

6. What are the three answers for each box below?

$\frac{1}{3}$ of 9 = _?_	$\frac{1}{2}$ of 6 = _?_	$\frac{1}{4}$ of 20 = _?_	$\frac{1}{5}$ of 20 = _?_
$3\overline{)9}$	$2\overline{)6}$	$4\overline{)20}$	$5\overline{)20}$
9 ÷ 3 =	6 ÷ 2 =	20 ÷ 4 =	20 ÷ 5 =

NUMBER OF PARTS

1. Bob and Ray have a large candy bar. "We'll eat half of it now," said Bob, "and save the other half for this afternoon."

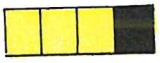
How would they divide the bar?

2. "All right," said Ray, "let each take a quarter now and we'll save 2 quarters."

3. Bob took $\frac{1}{4}$. Ray took $\frac{1}{4}$. There were $\frac{2}{4}$ left for the afternoon. What does the 2 in $\frac{2}{4}$ tell?

Each number in a fraction tells us something. The number above the line tells the number of parts. The number below the line tells the size of the equal parts.

4. Some of the examples below are not finished. What does the black part of each equal?

A  $= \frac{1}{4}$

B $= \frac{3}{4}$

C $= \frac{?}{3}$

D $= \frac{?}{5}$

E $= \frac{?}{8}$

F $= \frac{?}{8}$

FINDING PARTS OF A GROUP

A committee of 3 members is making 12 paper lanterns. What is each member's share?

Peggy says each equal share will be $\frac{1}{3}$ because the 3 in $\frac{1}{3}$ tells that 12 is to be divided into 3 equal parts. $\frac{1}{3}$ of 12 = ?. $3\overline{)12}$

Number a sheet of paper and write the answers:

1. $\frac{1}{3}$ of 15 =	**5.** $\frac{1}{3}$ of 24 =	**9.** $\frac{1}{2}$ of 14 =	**13.** $\frac{1}{2}$ of 12 =
2. $\frac{1}{2}$ of 10 =	**6.** $\frac{1}{5}$ of 35 =	**10.** $\frac{1}{4}$ of 20 =	**14.** $\frac{1}{3}$ of 21 =
3. $\frac{1}{4}$ of 12 =	**7.** $\frac{1}{2}$ of 16 =	**11.** $\frac{1}{5}$ of 25 =	**15.** $\frac{1}{2}$ of 18 =
4. $\frac{1}{5}$ of 30 =	**8.** $\frac{1}{4}$ of 8 =	**12.** $\frac{1}{3}$ of 18 =	**16.** $\frac{1}{5}$ of 40 =

George Burns
October 17

1.	12
2.	18
3.	11
4.	16
5.	—
6.	8
7.	6
8.	—
9.	15
10.	9
11.	13
12.	12
13.	7
14.	—
15.	15
16.	17
17.	—
18.	14
19.	—
20.	16

THE ANSWER STRIP

How well do you remember the facts in addition, subtraction, multiplication, and division?

An answer strip makes it easy to test many facts in a short time.

DIRECTIONS FOR MAKING AND USING AN ANSWER STRIP

1. Use a sheet of ruled paper. Cut it or fold and tear it the long way into two or three strips.

2. Write your name and the date at the top of a strip.

3. Number along the left side for answers to the facts your teacher will read.

4. Write only the answers as your teacher reads the number questions.

5. If you do not know the answer, make a mark (–) and put the next answer on the next line.

Teacher: See page 322 and also the Teacher's Guide for further instructions.

TESTING YOURSELF

Your teacher will read these for your answer strip. She will read some each day for four days.

Set 1. Addition

(1)	(6)	(11)	(16)	(21)	(26)
3 + 5	3 + 6	3 + 9	9 + 5	8 + 6	8 + 5
8 + 4	7 + 5	4 + 8	7 + 6	5 + 7	8 + 9
6 + 3	4 + 6	9 + 6	6 + 9	4 + 9	5 + 9
4 + 7	3 + 7	5 + 8	5 + 6	9 + 8	7 + 8
9 + 3	6 + 8	7 + 9	9 + 4	6 + 7	9 + 7

Set 2. Subtraction

(1)	(6)	(11)	(16)	(21)	(26)
12 − 4	18 − 9	11 − 8	13 − 6	16 − 7	15 − 7
11 − 6	13 − 4	16 − 9	12 − 7	14 − 8	13 − 9
14 − 7	12 − 3	13 − 8	14 − 5	11 − 3	15 − 6
11 − 9	11 − 7	14 − 9	13 − 7	15 − 9	17 − 9
12 − 5	14 − 6	11 − 4	17 − 8	13 − 5	15 − 8

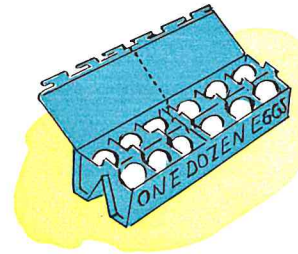
Set 3. Multiplication

(1)	(6)	(11)	(16)	(21)	(26)
2 2's	3 5's	2 5's	6 2's	7 5's	9 5's
4 5's	6 5's	5 5's	8 5's	10 5's	7 5's
2 3's	3 2's	4 2's	7 3's	7 2's	9 2's
4 3's	3 3's	8 2's	9 3's	8 3's	10 2's
5 2's	6 3's	5 3's	9 2's	10 3's	8 3's

Set 4. Division

(1)	(6)	(11)	(16)	(21)	(26)
2's in 4	2's in 6	2's in 8	3's in 12	2's in 14	2's in 16
5's in 20	5's in 15	5's in 10	5's in 30	5's in 45	5's in 40
3's in 6	3's in 15	2's in 12	3's in 24	3's in 27	2's in 2
2's in 10	3's in 9	3's in 18	2's in 18	3's in 3	3's in 21
5's in 5	5's in 25	4's in 8	5's in 35	5's in 50	6's in 12

PARTS OF A DOZEN



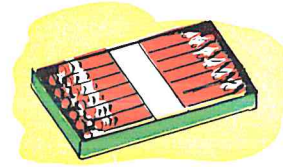
1. "Bob," said Mother, "will you go to the store and get a dozen eggs for me?"

a. How many eggs are a dozen? Count them.

b. How many eggs are 2 dozen?

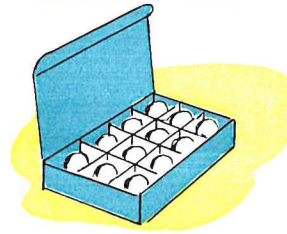
c. How many are a half dozen?

2. Nancy saw some things in a bakery. "How much are the cupcakes?" she asked. "Fifty cents a dozen," the clerk said. What other things in a bakery are sold by the dozen?



3. Sometimes pencils are sold by the dozen. Are a half dozen pencils the same number as a half dozen eggs?

4. Name other things that are sold by the dozen.

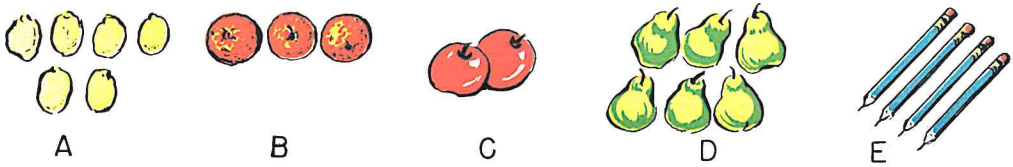


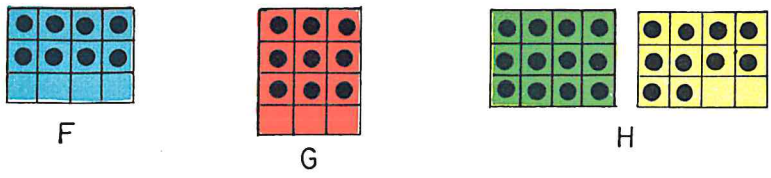
5. Have you ever seen a dozen eggs in a box like this? Count the eggs by threes.

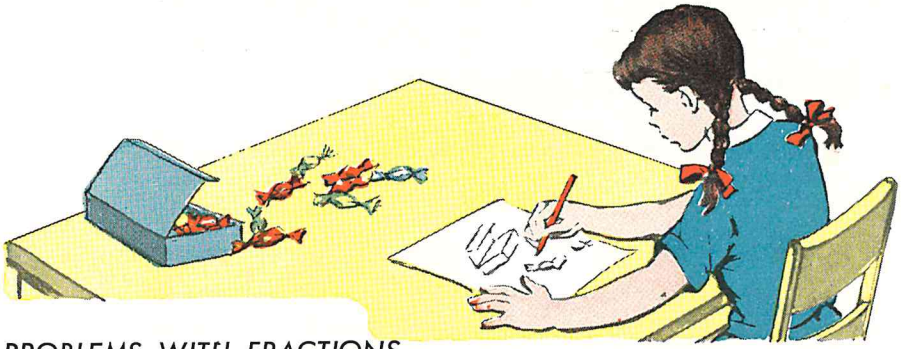
6. How many is $\frac{1}{4}$ of a dozen?

7. Which is more, $\frac{1}{3}$ dozen or $\frac{1}{2}$ dozen?

8. What part of a dozen is each group below?







PROBLEMS WITH FRACTIONS

Drawing a picture of each problem may help you.

1. "I want my candy to last 3 days," said Sue. "I will eat the same amount each day." What part does she eat each day?

2. If Jim eats $\frac{1}{4}$ of his candy each day, how many days will it last?

3. Thirty children belong in Rita's room. They go to the library in 3 equal groups. What is $\frac{1}{3}$ of 30?

4. Sandra says she will learn $\frac{1}{4}$ of her 20 spelling words each day. How many is that for each day?

5. Larry says he knows half of his 20 spelling words already. How many does he know?

6. Which is larger, $\frac{1}{2}$ of a cooky or $\frac{1}{2}$ of a cake? Can you tell? Which is more, $\frac{1}{2}$ of a pair or $\frac{1}{2}$ of a dozen?

• Halves are equal parts of the *same* thing, or of the same group, or equal groups.

Half of one thing or group may not be the same amount as half of another thing or another group.

7. We have gone 12 miles and are just half way. What is the total distance we are going?

You may have to draw a line to help with this one. If Bob's family drives half way to the lake the first day, then half of the distance left each day, how long will it take them to get to the lake?

If 2 is $\frac{1}{2}$ of a number, what is twice the number?

COMPARING FRACTIONS

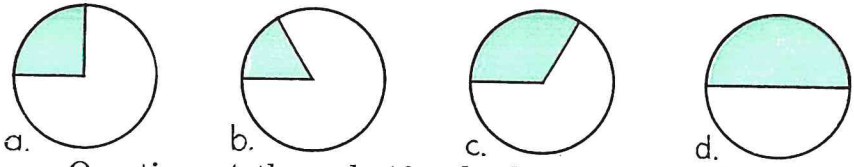
1. Which of these fractions is the largest?

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$

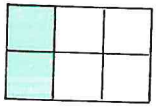
2. Which of these fractions is the smallest?

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$

3. Which of these sorts of circles is nearest $\frac{1}{3}$?

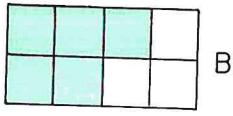


Questions 4 through 10 ask about the colored parts of Figures *A*, *B*, *C*, *D*, and *E*.



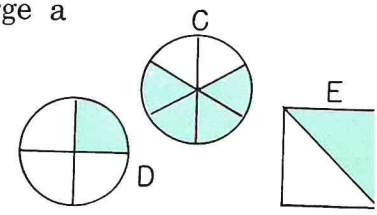
4. Look at figure *A*, *B*, *C*, *D*, and *E*. Into how many parts is each divided?

5. Which figure is $\frac{1}{4}$ colored? $\frac{5}{8}$ colored?



6. Which figure is $\frac{1}{3}$ colored? $\frac{1}{2}$ colored?

7. Which figure has twice as large a fraction colored as *D*?



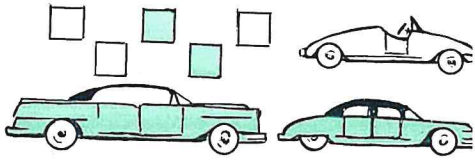
8. What fraction of *C* is colored? of *B*?

9. Is a larger part of *A* or of *E* colored?

10. Is more or less than half of *B* colored? of *C*?

11. What fraction of these five squares are colored?

12. What fraction of these three cars have tops?



Fourteen children are playing ball. This is $\frac{1}{2}$ of the class. How many are in the class all together?

One third of another class is in a play. Nine children are in the play. How many children are in the class?

ARITHMETIC WORDS

Do you know what each word means? You may act the meaning, show it on the chalkboard, or tell it.

1. fraction
2. difference
3. remainder
4. hundreds' place
5. tens' place
6. minus
7. plus
8. balance
9. column
10. measure
11. counter
12. multiply
13. subtract
14. divide
15. times
16. share
17. carrying
18. changing back
19. borrowing
20. piece
21. equals
22. sum
23. twice
24. double

MEANING QUIZ

Choose the best answer. Write its letter.

1. Which of these numbers is the double of 6?

a. 3 **b.** 6 **c.** 12 **d.** 66

2. Which of these signs means to divide?

a. + **b.** ÷ **c.** − **d.** ×

3. You may change back from tens to ones when you

a. add **b.** subtract **c.** multiply

4. You sometimes find the *remainder* when you

a. subtract **b.** add **c.** multiply

5. When you separate a group into parts, you

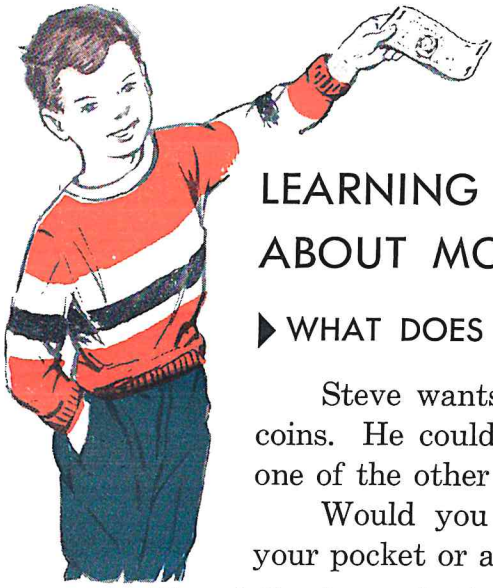
a. add it **b.** multiply it **c.** divide it

6. A boy's share is his

a. answer **b.** part **c.** duty **d.** sum

7. To take away is most like

a. adding **b.** multiplying **c.** subtracting



LEARNING ABOUT MONEY

▶ WHAT DOES A DOLLAR EQUAL?

Steve wants to change his dollar for other coins. He could get both piles of cents or any one of the other piles of coins pictured below.

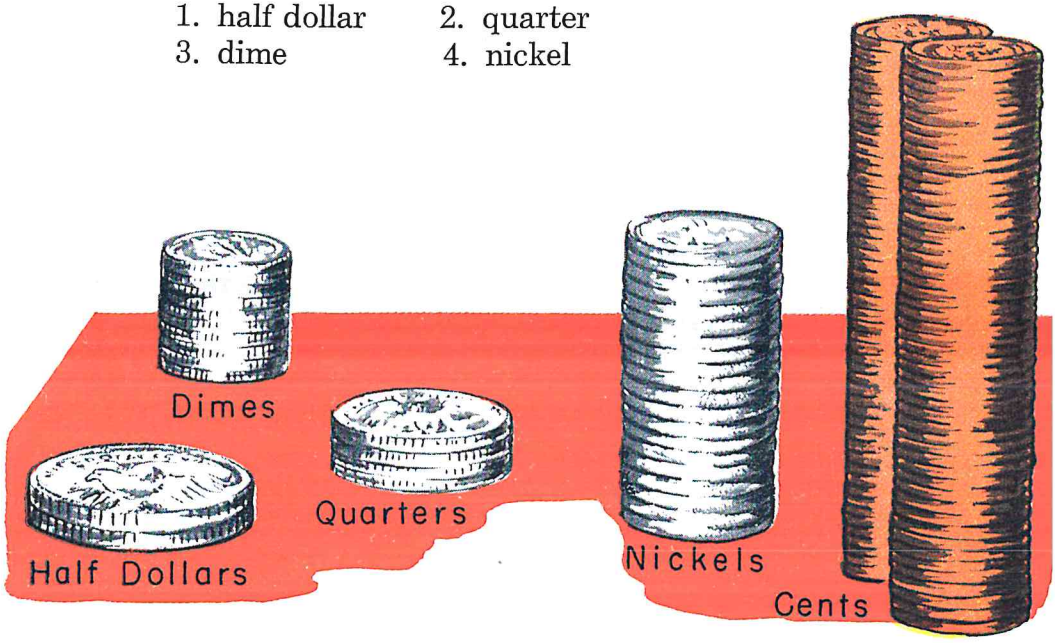
Would you rather carry Steve's dollar in your pocket or all these cents?

One dollar is worth the same as each one of these:

2 half dollars	$2 \times 50¢ = \$1.00$
4 quarter dollars	$4 \times 25¢ = \$1.00$
10 dimes	$10 \times 10¢ = \$1.00$
20 nickels	$20 \times 5¢ = \$1.00$
100 cents	$100 \times 1¢ = \$1.00$

How many cents is each of these coins worth?

1. half dollar
2. quarter
3. dime
4. nickel



READING AND WRITING DOLLARS AND CENTS

1. The sign for cents is written this way, ¢. We read *75¢* as **seventy-five cents.**

Read these numbers: 46¢ 12¢ 25¢ 10¢ 5¢ 1¢

2. The dollar sign is written this way, $. It comes before the numbers. We read *$5* as **five dollars.**

Read these numbers: $1 $12 $250 $65 $90 $106

3. When dollars and cents are written together, we use only the dollar sign. A point is used between the dollars and cents. Numbers at the left of the point stand for dollars. Numbers at the right of the point stand for cents.

4. We read dollars and cents together this way: $1.75 is **one dollar and seventy-five cents.** People sometimes say:

a dollar seventy-five or **one seventy-five**

5. Sometimes the dollar sign and the point are used to write cents alone. We read *$.10* as **ten cents.** It may be written also as $0.10. We read *$.08* as **eight cents.**

6. Read these:

a	b	c	d	e
20¢	$4	$3.20	$15.39	$4.05
$.35	$10	$1.05	$67.50	$0.06

7. Write these amounts of money. Use numbers and signs.

a. 75 cents
b. 6 cents
c. A half dollar
d. A quarter
e. Two dollars
f. A dollar and a half
g. One dollar and eighty cents
h. One dollar and fifteen cents
i. Three seventy-five
j. Five dollars and six cents

ADDING MONEY

Fred was given $2 for his birthday. There are many things he wants to buy.

1. How much will the toy car, the pencil, and the notebook cost?

Fred adds cents the way he adds other numbers.

How much do the three things cost?

$$\begin{array}{r} 19¢ \\ 25¢ \\ 10¢ \\ \hline 54¢ \end{array}$$

2. How much will the toy telephone and the car cost?

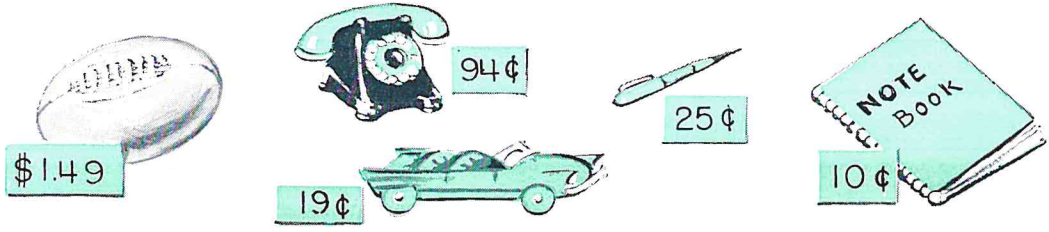
Tell how the addition is done. How is the sum written? 4 cents and 9 cents are 13 cents. 13 cents is 10 cents and 3 cents. What does Fred do with the 10 cents?

$$\begin{array}{r} {\scriptstyle 1} \\ \$\ .94 \\ .19 \\ \hline \$1.13 \end{array}$$

We nearly always write cents with the point and dollar sign when the sum may be more than one dollar. Write $.94 and not 94¢.

3. How much will the football, the telephone, and a car cost? Did Fred carry 20 cents to dimes? 10 dimes to dollars?

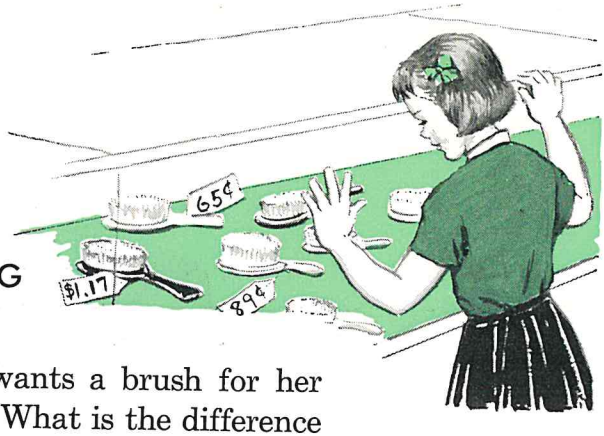
$$\begin{array}{r} {\scriptstyle 1\ 2} \\ \$1.49 \\ .94 \\ .19 \\ \hline \$2.62 \end{array}$$



4. Copy the additions below and find the sums:

a. $.35	**b.** $.25	**c.** $1.25	**d.** $2.69	**e.** $ .75	**f.** $2.50
.24	.49	2.36	.34	1.69	.89
.13	.69	1.48	.27	.63	.41

SUBTRACTING MONEY



1. Linda wants a brush for her dressing table. What is the difference between the prices of the 89¢ brush and the 65¢ brush? What do you do to find a difference?

$$\begin{array}{r} 89¢ \\ -65¢ \\ \hline 24¢ \end{array}$$

Linda subtracts cents the way she subtracts other numbers. What difference does she find?

2. What is the difference between the prices of the 65¢ brush and the one for $1.17?

Linda subtracts 5 from 7. But 6 dimes are more than 1 dime. Linda knows that $1 equals 10 dimes, so she subtracts 6 dimes from 11 dimes.

$$\begin{array}{r} \$1.17 \\ -.65 \\ \hline \$\ .52 \end{array}$$

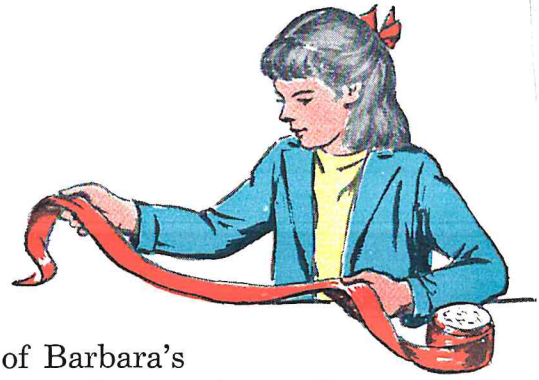
3. Linda has $3.45. If she spends $1.65, how much money will she have left?

Linda knows how to change one hundred back to tens. She changes one of the dollars to 10 dimes the same way. Can she take 6 dimes from 14 dimes?

$$\begin{array}{r} {\scriptstyle 2\ 14} \\ \$3.\not{4}5 \\ -1.65 \\ \hline \$1.80 \end{array}$$

4. Copy the subtractions below and find the differences:

a. $\$\ .69$ $\underline{\ .35}$	**b.** $\$\ .72$ $\underline{\ .28}$	**c.** $\$\ .95$ $\underline{\ .56}$	**d.** $\$1.37$ $\underline{\ .25}$	**e.** $\$1.75$ $\underline{\ .49}$
f. $\$1.50$ $\underline{\ .25}$	**g.** $\$1.25$ $\underline{\ .50}$	**h.** $\$1.10$ $\underline{\ .90}$	**i.** $\$2.25$ $\underline{\ .75}$	**j.** $\$2.15$ $\underline{\ .50}$
k. $\$2.45$ $\underline{\ .87}$	**l.** $\$3.32$ $\underline{1.68}$	**m.** $\$2.17$ $\underline{1.17}$	**n.** $\$3.29$ $\underline{\ .86}$	**o.** $\$1.65$ $\underline{\ .78}$



MULTIPLYING CENTS

1. How much will all of Barbara's ribbon cost? She is buying 3 yards at 25¢ a yard. Will it be quicker for Barbara to multiply or to add?

Estimate the answer first. How many quarters are in a dollar? Is 25¢ a quarter dollar? Will 3 × 25¢ be more or less than a dollar?

2. Barbara multiplies because it is a shorter way to find the cost. She thinks: "3 × 5 = 15¢. Carry 1 dime. 3 twos are 6, plus 1 is 7. 7 tens means 7 dimes."

^{1}25¢	^{1}$.25
×3	×3
75¢	$.75

3. How much money will Jim earn in 5 days at 70¢ a day?

Will the answer be more than a dollar? Why is it better to write 70¢ with a dollar sign and a point?

70 cents	$ .70
×5	×5
350 cents	$3.50

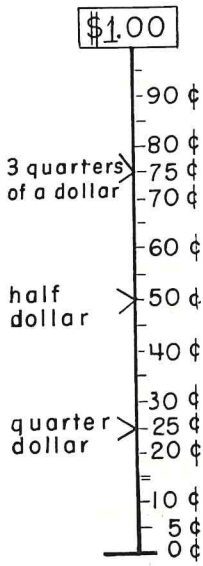
Do 350 cents and $3.50 mean the same amount?

• When you multiply cents, watch the point carefully. There are two cents' places in numbers of dollars and cents. One is the number of cents and one is the number of dimes. When they are read as one number, they mean cents.

4. Copy the multiplications and find the products:

a. $.42	**b.** $.35	**c.** $.60	**d.** $.80	**e.** $.49	**f.** $.61	**g.** $.93
2	2	3	5	2	5	3

COUNTING CHANGE



Here is a way to make change by counting.

If you give the clerk a dime to pay for a 6-cent pencil, he says, as he gives you 4 cents, "6 and 4 are 10."

If you buy something for 43¢ and give the clerk a half dollar, he gives you 2¢ and a nickel and says, "43, 45, 50." Does the chart help?

1. What does the clerk give you back and say when you give him a dime to pay for 4¢ worth?

2. Two dimes to pay for 13¢ worth?

3. A quarter to pay for 14¢ worth?

4. A dollar to pay for 70¢ worth?

Answer Sheet

Your teacher will show you how to make an *answer sheet.* Draw a line down the right side of your paper, $1\frac{1}{2}$ inches from the edge. Number down the right side of this line for your answers. Do your work on the left side.

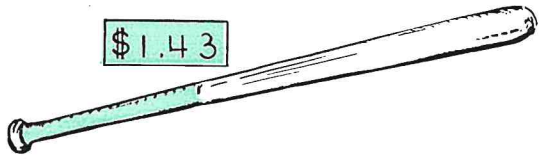
PRACTICE

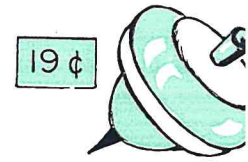
Do the examples below with an answer sheet.

1	2	3	4	5	6	7	8
$.24	$.32	$.53	$.35	$1.15	$3.44	$2.36	$2.54
.53	.45	.36	.32	5.72	4.35	6.53	3.32

9	10	11	12	13	14	15
$3.65	$1.55	$4.36	$5.45	$3.65	$3.43	$2.62
1.53	3.72	4.82	2.74	4.63	2.95	5.95

16	17	18	19	20	21	22
$3.47	$2.46	$7.57	$7.88	$6.79	$7.87	$7.79
5.65	9.98	4.79	3.97	6.86	6.58	9.57





DO THEY HAVE ENOUGH MONEY?

Number a sheet of paper for 12 answers.

1. Paul wants to buy a top for 19¢. Will a quarter be enough to pay for it?

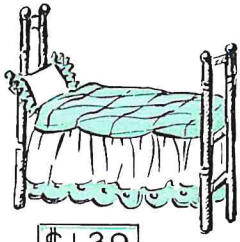
2. Jack saw a bat which sells for $1.43. Will a dollar and a half dollar buy it?

3. Joan saw a small pair of scissors marked 33¢. Will a quarter and a dime be enough to buy them?

4. Ann wants 47¢ worth of ribbon. Will her quarter and 2 dimes be enough?

5. Larry wants a toy gun that costs 76¢. Will his quarter and a half dollar buy it?

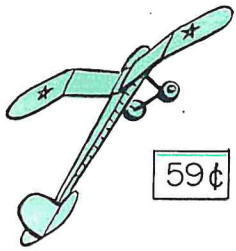
6. Mary wants an ice-cream soda which costs 29¢. Will 2 dimes and 2 nickels pay for it?



7. Bill says he could eat a hamburger. It costs 23¢. Bill has 3 nickels and 4 cents. Is that enough?

8. Mary's cutout book cost 95¢. Can Donna buy one like it with a dollar?

9. Patricia would like a doll bed that she saw in a store window. It costs $1.39. Will 2 half dollars and a quarter buy it?



10. Potato chips sell for 39¢ a bag. Are 7 nickels that much?

11. Bob has a dime, a quarter, and a nickel. He says he needs another nickel to buy crayons for 37¢. Does he need another nickel?

12. Sandy has 4 dimes and a quarter. Can he buy an airplane which costs 59¢?

UNIT TEST

Add Row 1. Subtract Row 2. Multiply Row 3.

	a	b	c	d	e	f
1.	\$ .47	\$3.06	\$ .65	\$1.69	\$ .36	\$4.08
	.98	1.38	1.08	.77	2.98	3.69
	.47	.95	.96	1.04	.78	2.39
2.	\$2.40	\$1.37	\$1.85	\$3.53	\$2.64	\$2.64
	.73	.87	.96	1.94	1.86	.90
3.	\$ .86	\$ .79	\$ .69	\$ .97	\$ .85	\$ .34
	3	5	2	3	5	5

GROWTH TEST

Watch the signs. Use an answer sheet (page 89).

1	2	3	4	5
109 − 75	73 + 22 + 24	225 + 476	791 − 437	20 × 8
6	**7**	**8**	**9**	**10**
$2\overline{)60}$	507 + 946	757 − 492	203 × 3	19 + 43 + 97
11	**12**	**13**	**14**	**15**
$7\overline{)210}$	$3\overline{)96}$	4 + 270 + 38	934 − 585	312 × 4
16	**17**	**18**	**19**	**20**
$9\overline{)189}$	383 − 294	$5\overline{)455}$	317 × 5	96 × 3

UNIT 8

PROBLEM SOLVING

CARL'S PROBLEM

Carl brought his pony, named Carrots, to school on pet day. What do you think Carl's problem is? It is: *How can everyone ride Carrots in so short a time?*

1. How long will the children have for riding? Miss King, their teacher, says they may ride during the pet show. The pet show begins at 2 P.M. and lasts till 3 P.M. How many minutes is that?

2. How long may each child ride, one at a time? There are 30 children. They may ride for 60 minutes all together. Will each have as long as 1 minute? 2 minutes? 3 minutes?

3. Does every boy and girl know how to guide a pony? Miss King solved that problem. She called Carl's daddy to see if he would lead Carrots. He said he would be at the school 15 minutes early. What time would that be?

4. Can you think of more problems about Carrots or about other pets?

5. Do your problems have a question in them?

• Every problem really has a question in it. Sometimes you have to ask it yourself, but it is there.

See if you can find the question for each problem on the next page.

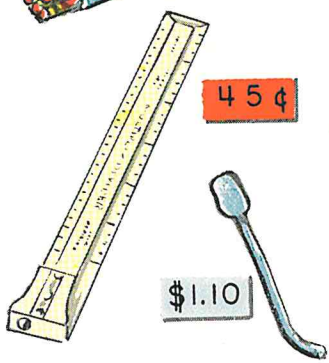
WHAT IS THE QUESTION?

1. Three boys have a problem. They want to buy a rubber football. It costs $1.95. Harold has $1. Jerry has 40¢. John has 50¢. Ask the rest of this problem.

How did you finish the problem? Did you ask yourself a question? What question?

2. Peggy has a problem. Her uncle sent 12 pencils with "Yellowstone National Park" on them. He says to share them equally with her 2 best girl friends. Peggy and her 2 friends are how many girls? Finish the problem.

Do you have to think the question, "How many will each girl get?"



3. Martha is looking at a ruler-pencil sharpener. It costs 45¢. She looks in her coin purse and sees 2 dimes, 4 nickels, and 8 cents. Finish Martha's problem.

4. Jack is looking at a bicycle horn that costs $1.75 and a kick-up stand that costs $1.10. Will $3.00 buy both of them? Finish the story. What question will Jack need to answer first?

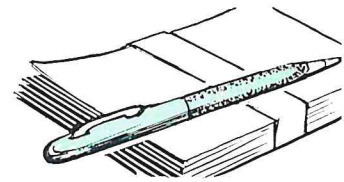
What is the answer?

5. Make a problem about something you are doing or want. Ask a question in your problem. It may be about something you want to buy, some distance, who has most of something, time, and so on.

THE QUESTION • THE FACTS • WHAT TO DO

Read each problem carefully.
What is the question?
Think about how you will finish the problem.
Do you add, subtract, multiply, or divide?

1. How much will both cost if a pencil costs 39¢ and a package of paper costs 25¢?



What is the question? Do you **add, subtract, multiply,** or **divide?**

2. How many stamps will Mary have left after she gives Tom 5? She now has 23 stamps.

Do you **add, subtract, multiply,** or **divide?**

3. Lynn has how many more shells than Patty? Lynn has 42 and Patty has 20.

4. How many sheets of paper are needed for a class? There are 31 children and each is to get 5 sheets.

5. Mother has 24 cookies. She wants to serve an equal number for each of 3 meals. What should she do?

6. Ann lives 4 miles east of town, and Sara lives 3 miles west of town. How far apart do they live?

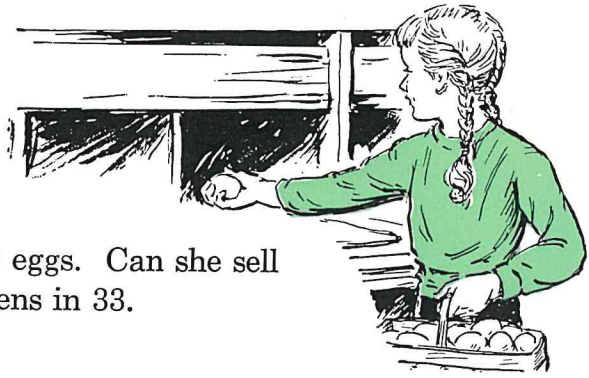
A drawing may help you think.

7. How many new words will Joe have in spelling for a week? He has 3 new words each school day.

8. What will be the equal share for each of two boys? Together they earned 6 dimes carrying groceries for Mrs. Brown.

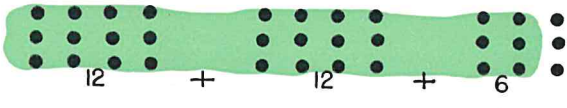
A man is 5 times as old as his son. The man is 35 years old. How old is the son? Do you add, subtract, multiply, or divide?

SOMETIMES IT HELPS TO DRAW A PICTURE



1. Alice gathered 33 eggs. Can she sell $2\frac{1}{2}$ dozen? Draw the dozens in 33.

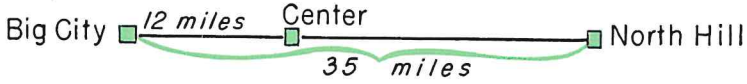
Suggestion:



$$\begin{array}{r} 33 \\ -30 \\ \hline 3 \end{array}$$

1 doz. + 1 doz. + $\frac{1}{2}$ doz. 3 eggs left

2. How far is it from Center to North Hill? All three towns are on the same straight highway. Center is 12 miles east of Big City. North Hill is 35 miles east of Big City.



3. How many papers did Paul sell? He sold 16 papers each of the first two days, 14 the next day, and 19 the last day.

1st day	16
2nd day	16
3rd day	14
4th day	19

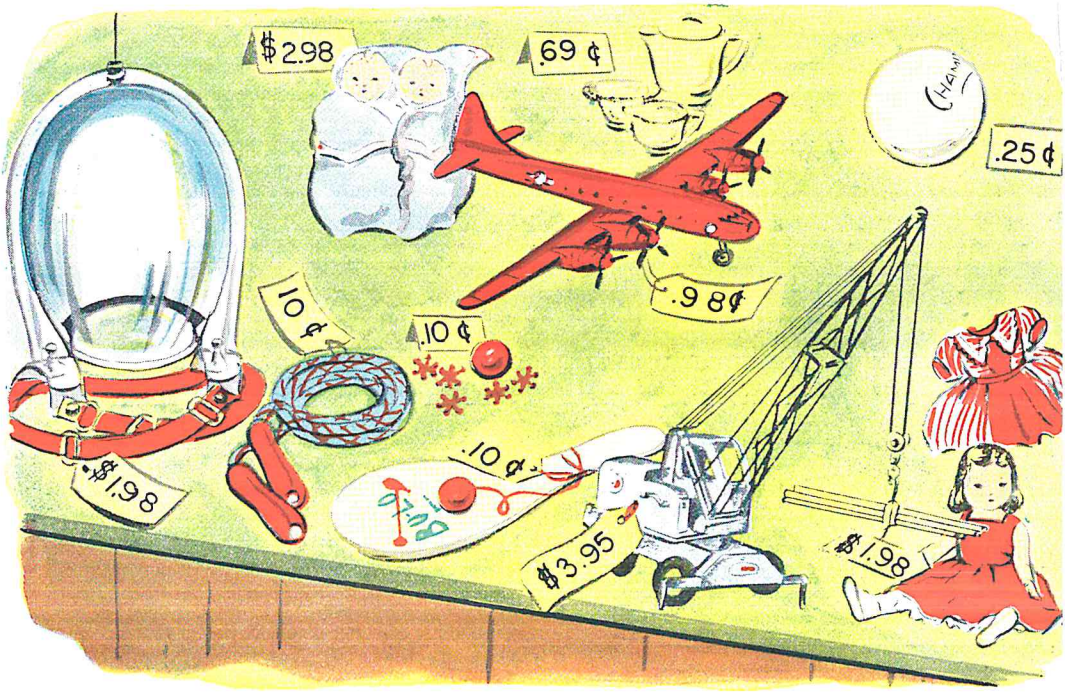
Draw pictures to help work the next three problems:

4. A quarter and 2 dimes equal how many nickels?

5. How long is it from 9:00 o'clock to 1:30?

6. Mike cut a paper in the middle. Then he cut each of the new pieces in the middle. Is each piece $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, or $\frac{1}{8}$ of the whole paper?

Work this without paper first. Then draw it to be sure. Ruth faces east. She turns half way around. Next she turns one quarter to the left, then half way around. Which way is she facing now?



MAKING PROBLEMS

It is fun to write problems of your own.

1. Write a problem about how much two toys cost.

2. Write a problem about the toy which costs most.

3. Write a problem about one toy costing more than another.

4. Write a problem to see if a girl has enough money to buy one of the toys in the picture.

5. Write a problem about getting change back.

6. Write a problem about earning money to buy toys.

7. Write a problem about giving toys away.

PRACTICE

Climb the ladder, page 34.

WORKING PROBLEMS

1. Helen, Jan and Kay are making a picture book for the Children's Hospital. How many pages will they need if they put 3 pictures on a page? They have 18 pictures.

2. There are 24 girls all together in the two fourth grade rooms. If they are divided into 3 equal teams, how many girls will be on each team?

3. John wants to finish his cowboy book tonight. He has 18 pages to read and 2 hours to read them. About how many pages should he read each hour?

4. How much do oranges cost Tom? He buys 5 pounds at 9¢ a pound.

5. How much will 5 records for Billy's record player cost? The records are $1.10 each.

6. John and Dick are taking a 15-mile bicycle trip. If they travel 5 miles an hour, how many hours will it take?

7. Tom is counting out drawing paper for the art lesson. There are 3 piles of paper with 12 sheets in each pile. How many sheets of drawing paper are there?

8. Alice sells 3 tickets for the school play. The tickets cost 20¢ each. How much money does she receive for all three tickets?

9. Will a dollar be enough to pay for a 59-cent game and a 49-cent toy?

DO YOU ADD, SUBTRACT, MULTIPLY, OR DIVIDE?

Read each problem. Decide whether to add, subtract, multiply, or divide. Then work the problem.

1. How much will 5 candy bars cost at 8¢ each?

2. Jim rode his bicycle 10 miles in 2 hours. How far would that be in one hour?

3. How much has Lynn grown in a year? She was 51 inches tall last year and is now 53 inches tall.

4. How many chairs are there in 7 rows of 5 chairs each?

5. How much will two toys cost if one costs 39¢ and the other costs 59¢?

6. How many flowers did Dot plant? She planted 18 flowers in one row, 14 in one, and 20 in another.

7. Mother has 24 cookies for 8 boys. How many cookies will there be in each boy's equal share?

8. Doris had 32 shells and finds 12 more. How many does she now have?

9. Rita bought a pencil for 39¢. How much change should she get back from a half dollar?

10. Ray's father drove 275 miles one day and 310 miles the next. How far did he drive both days?

11. How many pieces of candy are in a box that has 6 rows one way and 3 rows the other way?

12. Betty has 44 stamps. If she gives 8 away, how many will she have?

ALL YOU KNOW ABOUT FIVE

This is Dan's paper. He has written everything that he remembers about five. Do you know these number facts?

Write everything that you can remember about three.

Dan Barker

November 29

Addition

$0+5=5$ $5+0=5$ $1+4=5$ $4+1=5$ $3+2=5$ $2+3=5$

$2+2+1=5$ $2+1+1+1=5$ $1+1+1+1+1=5$

Subtraction

$5-5=0$ $5-0=5$ $5-1=4$ $5-4=1$

$5-2=3$ $5-3=2$

Multiplication

$5\times2=10$ $5\times3=15$ $5\times4=20$ $5\times5=25$ $5\times6=30$ $5\times7=35$ $5\times8=40$ $5\times9=45$

Division

$10\div5=2$ $15\div5=3$ $20\div5=4$ $25\div5=5$ $30\div5=6$ $35\div5=7$ $40\div5=8$ $45\div5=9$

$5\overline{)10}$ $5\overline{)15}$ $5\overline{)20}$ $5\overline{)25}$ $5\overline{)30}$ $5\overline{)35}$ $5\overline{)40}$ $5\overline{)45}$

Fractions

$\frac{1}{5}$ of $10=2$ $\frac{1}{5}$ of $20=4$ $\frac{1}{5}$ of $30=6$ $\frac{1}{5}$ of $40=8$

$\frac{1}{5}$ of $15=3$ $\frac{1}{5}$ of $25=5$ $\frac{1}{5}$ of $35=7$ $\frac{1}{5}$ of $45=9$

THE FOURS

UNIT 9

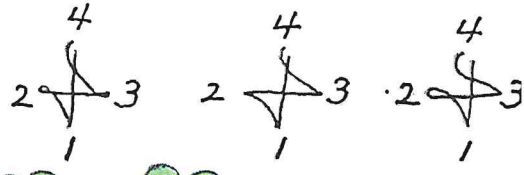
PATTERNS OF FOURS

IN MUSIC

Do you like a parade?
Hear the leader count!

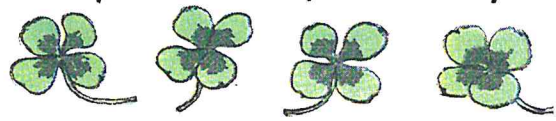
1 2 3 4 1 2 3 4 1 2 3 4
1 2 3 4 1 2 3 4 1 2 3 4

The fours are like music.
Watch the leader's hand.

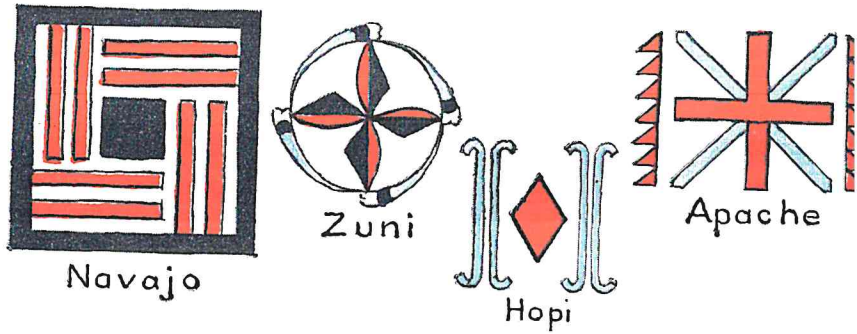


IN NATURE

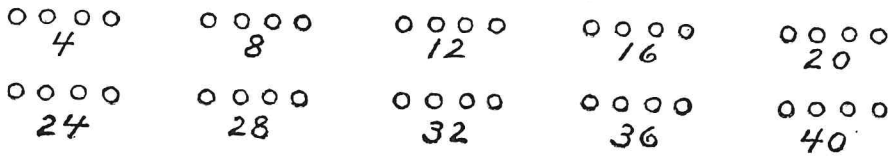
It's fun to look for four-leaf clovers.



IN ART

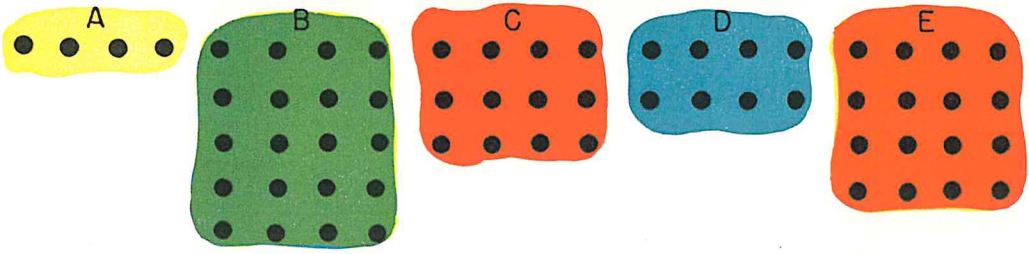


IN NUMBERS



FAMILIES OF FOUR

Do you know these families of four?



1×4	5×4	3×4	2×4	4×4
4×1	4×5	4×3	4×2	
$4\overline{)4}$	$4\overline{)20}$	$4\overline{)12}$	$4\overline{)8}$	$4\overline{)16}$
$1\overline{)4}$	$5\overline{)20}$	$3\overline{)12}$	$2\overline{)8}$	

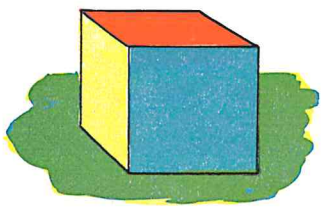
Write the products. Use folded paper.

1. 4	4	3	5	4	2	1	4
2	5	4	4	4	4	4	3
2. 6	3	5	8	9	3	7	3
5	7	3	3	5	9	5	7

Write the quotients. Use folded paper.

3. $4\overline{)12}$	$4\overline{)20}$	$4\overline{)8}$	$4\overline{)16}$	$4\overline{)4}$	$4\overline{)20}$	$4\overline{)12}$	$4\overline{)8}$
4. $3\overline{)15}$	$2\overline{)8}$	$5\overline{)20}$	$4\overline{)12}$	$3\overline{)9}$	$4\overline{)8}$	$5\overline{)10}$	$4\overline{)16}$
5. $4\overline{)12}$	$3\overline{)24}$	$5\overline{)15}$	$3\overline{)18}$	$4\overline{)16}$	$2\overline{)14}$	$4\overline{)20}$	$3\overline{)27}$

Be careful with this one: How many edges has this block? Find the answer first and then check with a real block.



SIX FOURS AND FOUR SIXES

A classroom has 6 tables. Four children sit at each table. How many children can sit at all the tables at one time? How can you find the answer to this problem?

24

$6 \times 4 =$

$4 \times 6 =$

$6\overline{)24}$

$4\overline{)24}$

Jack adds 6 fours:

4
4
4
4
4
4
24

Betty knows that 5 fours are 20. Another 4 makes 24.

4
×5
20
+4
24

Ann counts by fours: 4, 8, 12, 16, 20, 24

Are 6 fours 24?

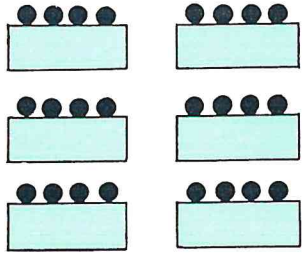
$6 \times 4 =$

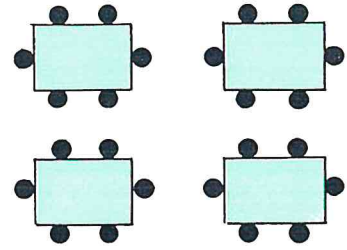
4
×6

Are 4 sixes 24?

$4 \times 6 =$

6
×4





1. How many groups of 4 each can you make with 24 counters?

How many is $4\overline{)24}$?

$24 \div 4 =$?

$\frac{1}{4}$ of 24 = ?

2. How many groups of 6 each can you make with 24 counters?

How many is $6\overline{)24}$?

$24 \div 6 =$?

$\frac{1}{6}$ of 24 = ?

SEVEN FOURS AND FOUR SEVENS

6 fours are 24, and 4 more are ?.

7 fours are ?. 4 sevens are ?.

How many is $\frac{1}{7}$ of 28?

How many is $\frac{1}{4}$ of 28?

Which is more, $\frac{1}{7}$ of 28 or $\frac{1}{4}$ of 28?

$7 \times 4 =$ $4 \times 7 =$

Which is more, 7×4 or 4×7?

28

$7 \times 4 =$

$4 \times 7 =$

$4\overline{)28}$

$7\overline{)28}$

1. If each of 6 girls is to carry 4 flags in a parade, how many flags will be needed?

2. How many quarts of milk are left at Jane's house each week? The milk man leaves 4 quarts every day.

3. How many days are there in a week? Four weeks will have how many days? Two weeks? Three weeks?

4. How many weeks are there in 14 days? in 28 days?

5. Which is the first day of the week? Which is the last day of the week? Which day is the middle of the week? Which day comes just before Friday?

NOVEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

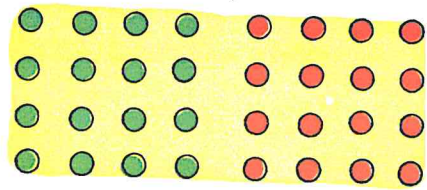
Answer on folded paper:

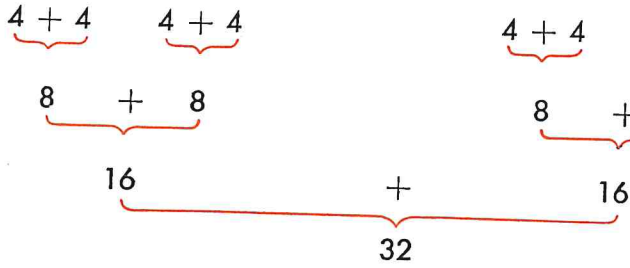
	a	b	c	d	e	f	g	h	i
6.	7×4	4×5	3×6	8×3	4×6	5×7	4×7	9×3	6×4
7.	$7\overline{)28}$	$6\overline{)24}$	$3\overline{)18}$	$9\overline{)27}$	$4\overline{)28}$	$4\overline{)20}$	$5\overline{)30}$	$7\overline{)21}$	
8.	$3\overline{)27}$	$7\overline{)28}$	$6\overline{)30}$	$5\overline{)20}$	$4\overline{)28}$	$6\overline{)18}$	$4\overline{)24}$	$3\overline{)21}$	

EIGHT FOURS AND FOUR EIGHTS

How many are 4 fours?
How many are 16 and 16?
Do 16 and 16 equal 8 fours?
How many fours are there in 32?
How many eights are there in 32?
Look at these 32 dots: How many 2's are in the 32 dots? 4's?
How many 8's? 16's?
See how 8 fours balance!

32
$8 \times 4 =$
$4 \times 8 =$
$4\overline{)32}$
$8\overline{)32}$





Answer these examples on folded paper:

Multiply:

1.	8 × 4	7 × 3	3 × 4	6 × 5	7 × 4	9 × 3	7 × 2	6 × 4	5 × 9
2.	2 × 9	5 × 8	4 × 6	3 × 7	4 × 8	6 × 3	5 × 5	3 × 8	4 × 7

Divide:

3.	$9\overline{)27}$	$8\overline{)32}$	$3\overline{)21}$	$7\overline{)28}$	$4\overline{)24}$	$4\overline{)32}$	$5\overline{)45}$	$4\overline{)28}$
4.	$6\overline{)24}$	$7\overline{)35}$	$9\overline{)18}$	$5\overline{)25}$	$8\overline{)24}$	$6\overline{)30}$	$3\overline{)24}$	$2\overline{)16}$

PROBLEMS AND PRACTICE

1. Four boys want to share 24 pieces of candy equally. How many pieces should each boy get?

2. How many shells did Dick have last year? He now has 27. He says he has exactly 3 times as many as last year.

3. How much more money does Ann need to buy a doll which costs $2.98? She has $1.45.

4. You know what each pencil costs. You know how many pencils you want. How would you find out what all of the pencils would cost?

Do candy bars cost more at 10¢ each or at 3 bars for 25¢?

Answer Strip Practice

$7 + 6$	(1)	$13 - 8$
$9 + 5$		$12 - 7$
$4 + 8$		$13 - 6$
$7 + 5$		$14 - 5$
$9 + 4$		$17 - 8$
$8 + 9$	(6)	$13 - 7$
$5 + 7$		$15 - 9$
$8 + 3$		$12 - 8$
$6 + 9$		$16 - 7$
$9 + 8$		$11 - 3$
$6 + 7$	(11)	$13 - 9$
$8 + 5$		$12 - 5$
$7 + 8$		$14 - 8$
$9 + 6$		$15 - 7$
$5 + 8$		$17 - 9$
$9 + 7$	(16)	$13 - 5$
$4 + 9$		$15 - 6$
$5 + 9$		$14 - 9$
$6 + 8$		$13 - 4$
$8 + 7$		$16 - 9$
$7 + 9$		$14 - 6$
$8 + 6$		$15 - 8$

PRACTICE

1. $7 + 6 = 13$,	so $17 + 6 =$?;	$27 + 6 =$;	$37 + 6 =$
2. $5 + 4 = 9$,	so $15 + 4 =$?;	$25 + 4 =$;	$35 + 4 =$
3. $3 + 8 = 11$,	so $13 + 8 =$?;	$23 + 8 =$;	$33 + 8 =$
4. $6 + 4 = 10$,	so $16 + 4 =$?;	$26 + 4 =$;	$36 + 4 =$
5. $5 + 8 = 13$,	so $15 + 8 =$?;	$25 + 8 =$;	$35 + 8 =$
6. $9 + 9 = 18$,	so $19 + 9 =$?;	$29 + 9 =$;	$39 + 9 =$
7. $3 + 4 = 7$,	so $13 + 4 =$?;	$23 + 4 =$;	$33 + 4 =$
8. $9 + 3 = 12$,	so $19 + 3 =$?;	$29 + 3 =$;	$39 + 3 =$

NINE FOURS AND FOUR NINES

How many are 7 fours? 8 fours?
How many are 9 fours? 4 nines?
How many fours are there in 36?
How many nines are there in 36?
How many is $\frac{1}{4}$ of 36? $\frac{1}{9}$ of 36?
How many are 10 fours?
9 fours are how many less than 10 fours?

36
$9 \times 4 =$
$4 \times 9 =$
$4\overline{)36}$
$9\overline{)36}$

1. If you know 10 times a number, how can you find 9 times the same number? Study these pairs:

$10 \times 1 = 10$	$10 \times 2 = 20$	$10 \times 3 = 30$	$10 \times 4 = 40$
$9 \times 1 = 9$	$9 \times 2 = 18$	$9 \times 3 = 27$	$9 \times 4 = 36$

2. Give the answers for each row in the table below:

MULTIPLICATION FAMILIES WITH FOURS

4	4	4	4	4	4	4	4	4	4
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
4	4	4	4	4	4	4	4	4	4
$4\overline{)4}$	$4\overline{)8}$	$4\overline{)12}$	$4\overline{)16}$	$4\overline{)20}$	$4\overline{)24}$	$4\overline{)28}$	$4\overline{)32}$	$4\overline{)36}$	$4\overline{)40}$
$1\overline{)4}$	$2\overline{)8}$	$3\overline{)12}$	$4\overline{)16}$	$5\overline{)20}$	$6\overline{)24}$	$7\overline{)28}$	$8\overline{)32}$	$9\overline{)36}$	$10\overline{)40}$

3. Multiply:

a. $\begin{array}{r} 102 \\ \times\ 4 \\ \hline \end{array}$ **b.** $\begin{array}{r} 896 \\ \times\ 3 \\ \hline \end{array}$ **c.** $\begin{array}{r} 647 \\ \times\ 4 \\ \hline \end{array}$ **d.** $\begin{array}{r} 204 \\ \times\ 8 \\ \hline \end{array}$ **e.** $\begin{array}{r} 935 \\ \times\ 4 \\ \hline \end{array}$ **f.** $\begin{array}{r} 692 \\ \times\ 5 \\ \hline \end{array}$

4. Divide:

a. $4\overline{)124}$ **b.** $5\overline{)205}$ **c.** $4\overline{)160}$ **d.** $7\overline{)287}$ **e.** $4\overline{)320}$ **f.** $4\overline{)368}$
g. $4\overline{)204}$ **h.** $4\overline{)284}$ **i.** $6\overline{)240}$ **j.** $9\overline{)369}$ **k.** $3\overline{)129}$ **l.** $8\overline{)328}$

DRAWING PICTURES TO SOLVE PROBLEMS

Draw a picture to find the answer for each problem. Then work each problem with numbers.

1. Bob has 20 pieces of candy. He wants to divide them equally among 4 boys. How many pieces will each boy get?

2. Sue has 35 pennies. She stacks them in piles of 5 each to see how many nickels they are worth. How many piles are there?

3. How many children are there in each group? There are 36 children in Jack's room. They divide into 4 equal groups for games.

4. Nancy gathered 24 eggs. She put them in groups of 6 each so that she could count dozens easily. How many groups of 6 are there?

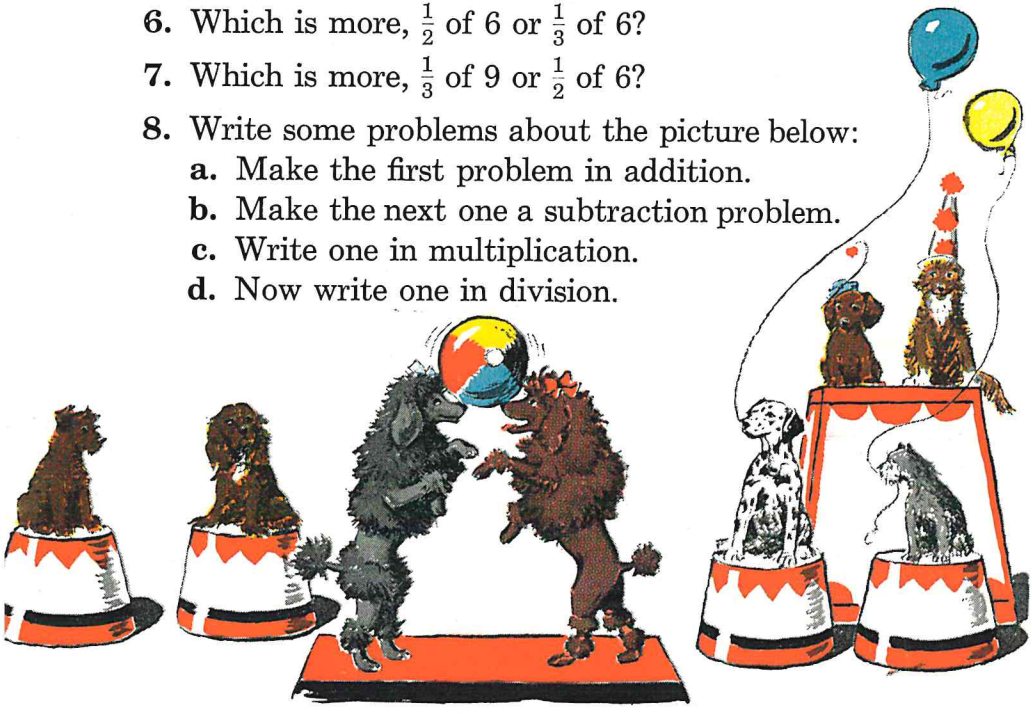
5. David bought a dozen bars of soap to put in Red Cross boxes. His room has 4 boxes to fill. How many bars can he put in each box?

6. Which is more, $\frac{1}{2}$ of 6 or $\frac{1}{3}$ of 6?

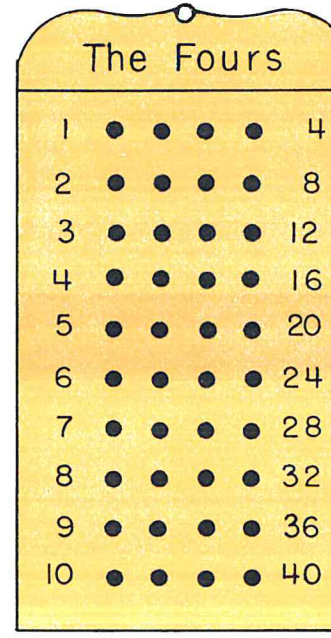
7. Which is more, $\frac{1}{3}$ of 9 or $\frac{1}{2}$ of 6?

8. Write some problems about the picture below:

- **a.** Make the first problem in addition.
- **b.** Make the next one a subtraction problem.
- **c.** Write one in multiplication.
- **d.** Now write one in division.



A TABLE OF FOURS



1. Think of the many animals that have 4 legs. Horses, dogs, cats, bears, elephants—how many can you name?

2. What does man make that has 4 legs? Tables, beds, and what else?

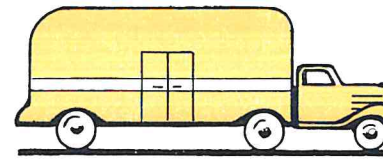
3. What does man make with 4 wheels? Wagons, cars—anything else? Some train cars have 4 wheels at each end.

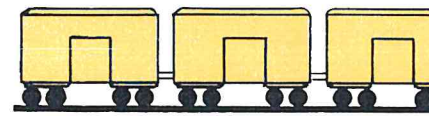
4. Four must be good for legs and wheels because it is two pairs. There can be one of each pair on each side. They balance each other.

5. Can you see all the wheels?

a. How many wheels has this truck?

b. How many wheels has this train? How many ways can you write the example?





6. Answer these without looking at the table of fours. Then check with the table.

1 four is ?
2 fours are ?
4 fours are ?
6 fours are ?
8 fours are ?

10 fours are ?
3 fours are ?
5 fours are ?
7 fours are ?
9 fours are ?

$9 \times 4 =$?
$7 \times 4 =$?
$5 \times 4 =$?
$8 \times 4 =$?
$3 \times 4 =$?

PRACTICE

1. $4\overline{)360}$ **2.** $4\overline{)248}$ **3.** $4\overline{)324}$ **4.** $4\overline{)160}$ **5.** $4\overline{)288}$

6. $4\overline{)208}$ **7.** $4\overline{)320}$ **8.** $4\overline{)280}$ **9.** $4\overline{)124}$ **10.** $4\overline{)200}$

SANDRA BUYS STAMPS

1. How many 2-cent stamps can Sandra buy for a dime?

2. How many 6-cent stamps will Sandra get for 30¢?

3. How much will eight 4-cent stamps cost?

4. What will nine 3-cent stamps cost?

5. Sandra has enough money to buy five 6-cent stamps. How many 3-cent stamps would the same amount of money buy?

Why are stamps postmarked when they are used to mail a letter?

How many 2-cent and 3-cent stamps can you buy for a quarter and have no money left over?

PRACTICE (Multiplication)

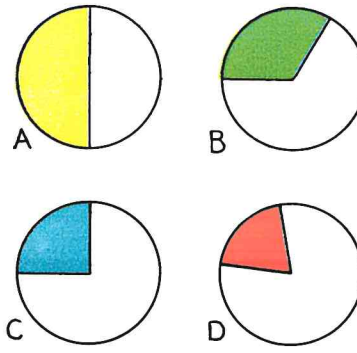
	a	b	c	d	e	f
1.	32 × 4	90 × 4	13 × 4	50 × 4	47 × 4	58 × 4
2.	201 × 4	123 × 4	219 × 4	67 × 4	28 × 4	316 × 4

PRACTICE (Answer Strip)

(1)	(6)	(11)	(16)	(21)
3 × 6	4 × 6	7 × 3	6 × 4	3 × 9
4 × 4	9 × 3	9 × 4	3 × 7	4 × 8
8 × 3	8 × 4	3 × 8	4 × 9	7 × 2
7 × 4	3 × 4	4 × 7	6 × 3	4 × 3
3 × 5	4 × 5	5 × 3	5 × 4	2 × 9

(1)	(6)	(11)	(16)	(21)
18 ÷ 3	24 ÷ 4	21 ÷ 7	24 ÷ 6	27 ÷ 3
16 ÷ 4	27 ÷ 9	36 ÷ 9	21 ÷ 3	32 ÷ 4
24 ÷ 8	32 ÷ 8	24 ÷ 3	36 ÷ 4	14 ÷ 2
28 ÷ 7	12 ÷ 3	28 ÷ 4	18 ÷ 6	12 ÷ 4
15 ÷ 3	20 ÷ 4	15 ÷ 5	20 ÷ 5	18 ÷ 9

PARTS OF CIRCLES



Part of each circle is colored.

1. Which circle is $\frac{1}{4}$ colored?

2. Which circle is $\frac{1}{2}$ colored?

3. Which circle is $\frac{1}{5}$ colored?

4. Which circle is $\frac{1}{3}$ colored?

5. How much is $\frac{1}{2}$ of 12? $\frac{1}{2}$ of 16? $\frac{1}{2}$ of 8?

6. How much is $\frac{1}{4}$ of 16? $\frac{1}{4}$ of 28? $\frac{1}{4}$ of 36?

7. How much is $\frac{1}{5}$ of 20? $\frac{1}{5}$ of 35? $\frac{1}{5}$ of 45?

8. How much is $\frac{1}{3}$ of 18? $\frac{1}{3}$ of 27? $\frac{1}{3}$ of 21?

9. Jim and Tom each took half of some candy. Did one take more than the other? How do you know?

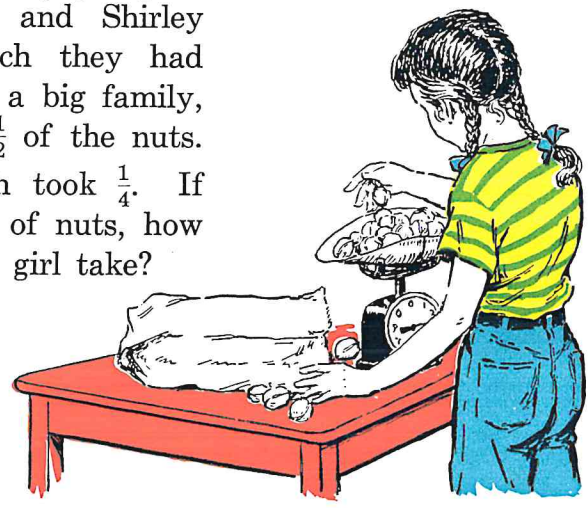
10. Are all the thirds of the same thing always equal?

11. How many quarters does a whole thing always have?

12. What is meant when we say a person divides fairly?

13. Can you make a rule that will tell which of two fractions is larger, as $\frac{1}{4}$ or $\frac{1}{3}$; $\frac{1}{5}$ or $\frac{1}{2}$?

14. Norma, Jane, and Shirley shared the nuts which they had gathered. Norma has a big family, so the girls gave her $\frac{1}{2}$ of the nuts. Jane and Shirley each took $\frac{1}{4}$. If there were 12 pounds of nuts, how many pounds did each girl take?



PRACTICE

Set 1. Addition

1. 56 99 38	**2.** 77 58 87	**3.** 49 77 68	**4.** 78 67 39	**5.** 79 48 35	**6.** 748 956
7. 864 789	**8.** 377 659	**9.** 548 793	**10.** 387 745	**11.** 726 358	**12.** 358 985
13. 9 8 6 8	**14.** 9 9 8 5	**15.** 8 7 8 7	**16.** 6 9 4 3	**17.** 5 8 4 6	**18.** 7 9 4 5

19. $67 + 459 + 98$ **20.** $5 + 68 + 88 + 139$

Set 2. Subtraction

	a	b	c	d	e	f	g
1.	978 628	963 286	645 597	198 73	825 536	732 480	958 480
2.	273 64	690 153	174 96	349 340	237 154	461 98	151 137
3.	890 720	607 543	259 234	774 279	107 59	430 376	252 243

TESTING YOURSELF

Use an answer strip.

(1)	(6)	(11)	(16)	(21)
$10 - 4$	$14 - 8$	$13 - 7$	$13 - 9$	$14 - 9$
$12 - 3$	$12 - 7$	$17 - 8$	$15 - 7$	$15 - 8$
$11 - 7$	$11 - 8$	$15 - 9$	$17 - 9$	$13 - 4$
$13 - 6$	$14 - 5$	$16 - 7$	$13 - 5$	$16 - 9$
$11 - 3$	$11 - 4$	$14 - 6$	$15 - 6$	$13 - 8$

MEASURES

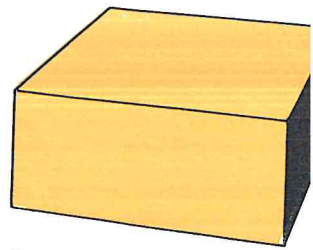
▶ HOW LONG?

1. Tony and Carol are measuring the length of a space to cover with Christmas paper. Tony measures with a yardstick. He gets 2 yards and 1 foot 6 inches. Carol's tape shows $7\frac{1}{2}$ feet. Use a yardstick to see if these measures are the same.

2. Without looking at your ruler, draw a line one inch long. Now draw a line 3 inches long; one 6 inches long; one 8 inches long. Check your lines with a ruler.

3. Who can draw a line nearest a foot long on the chalkboard? Who can show on the chalkboard a distance nearest one yard? Measure the lines to see whose line is nearest.

4. Measure the box. How long is it? How high is it? Its length is _?_. Its height is _?_. Does it look to be as wide as it is long? Are things usually longer than they are wide or wider than they are long?



5. Estimate the length of each line below. (To **estimate** means to think about a length, a weight, or another measure, and to make your best judgment.) Write your estimates. Check them by measuring the lines.

a. _____

b. _____

c. _____

d. _____

e. _____

HOW HIGH?

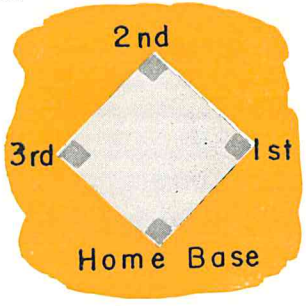
1. How high from the floor are these things? Estimate first, then measure.

a. a chair seat **c.** a light switch **e.** a desk top
b. a door knob **d.** the chalkboard **f.** a table top

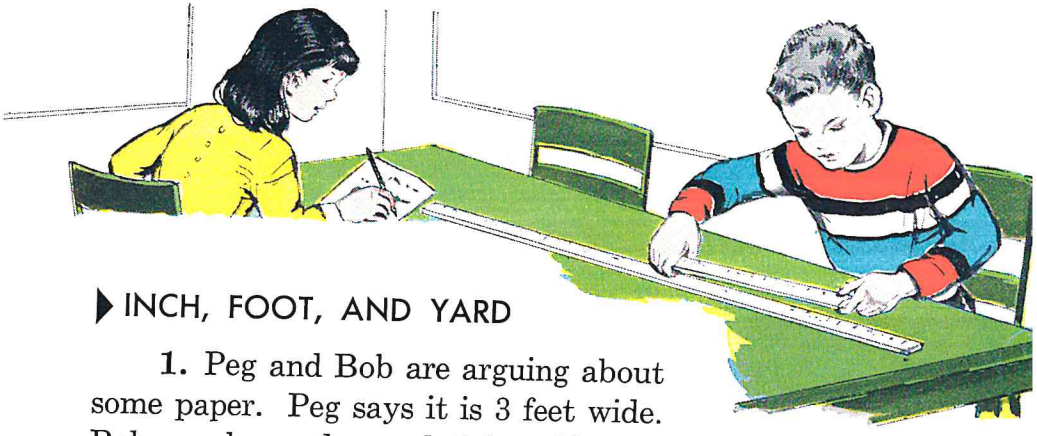
2. Are all the drinking fountains at your school the same height? Are all the chairs in your room the same height? Can the height of the chair seats be changed? Is your chair seat the right height for you?

3. About how tall are most grown-up people?

4. Here is a square baseball field for boys and girls. All four sides are the same length. How far is it from one base to the next? How far is it around all bases?



Would a man 7 feet tall be *fairly* tall or *very* tall? Could he walk through the doorway of your room easily?



INCH, FOOT, AND YARD

1. Peg and Bob are arguing about some paper. Peg says it is 3 feet wide. Bob says he used a yardstick and he knows it is a yard wide. Measure a yardstick with a foot ruler. Who is right?

2. Look at a ruler and a yardstick.

a. Do 12 inches = 1 foot? **b.** Do 3 feet = 1 yard?

c. Do 36 inches = 1 yard?

3. The names for measures are written so often that people have made shorter ways to write them. For some they use the first 2 or 3 letters. For others they use the first and last letters. Which letters are used for these?

inch = in. foot = ft. yard = yd.

Do not use an *s* with an abbreviation to show more than one unit of measure:

inches = in. feet = ft. yards = yd.

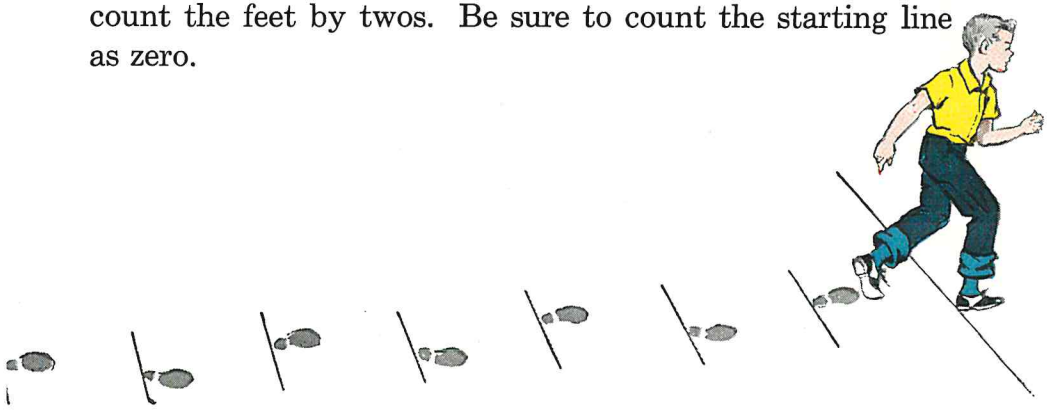
PRACTICE

Subtract. Use an answer sheet (see page 89).

1. 153 − 85	**7.** 726 − 598	**13.** 861 − 678
2. 162 − 68	**8.** 645 − 567	**14.** 158 − 89
3. 146 − 97	**9.** 962 − 897	**15.** 346 − 267
4. 222 − 73	**10.** 731 − 646	**16.** 295 − 78
5. 264 − 186	**11.** 927 − 649	**17.** 156 − 79
6. 541 − 475	**12.** 672 − 596	**18.** 644 − 585

ESTIMATING DISTANCES

1. Make marks on the floor or ground that are 2 ft. apart. Learn to put your heel on the marks as you take steps. Then learn to step two feet without looking at the marks. You can estimate distances this way. You can count the feet by twos. Be sure to count the starting line as zero.



This boy counted 14 ft. Was he right?

"Step off" means to estimate by stepping. Your father may step a whole yard at a time. You should step 2 ft. as you estimate.

2. Step off the distances below. See if you and other children estimate the same number of feet. Then measure to see who is closest.

a. The width of your classroom; the length.

b. The length of the playground; the width.

c. Other parts of the playground.

3. Is estimating always accurate enough?

4. Try estimating, stepping off, and measuring distances at home.

Materials needed for tomorrow: scales; sand, corn, or beans; paper sacks; container for butter or substitute; pint, quart, and gallon containers.

HOW HEAVY IS A POUND?

1. Larry weighs 65 pounds. Peggy weighs 67 pounds.

What does a *pound* mean?

Can you see how a foot looks? Is it easy to know what a foot means?

Can you see how a pound looks?

Does a pound of cotton look like a pound of sand?

Is it better to say that you can see what a pound is like, or to say that you can feel what it is like?

2. Do you know how it feels to lift a pound? It is fun to estimate weights. Weigh corn or beans or sand until you get a pound. Then lift it. See how closely you can get another pound by estimating. Close your eyes. Practice until you are good. Keep bags which will hold several pounds so that you can learn to estimate different numbers of pounds. Lift 5 pounds; 10 pounds; other numbers of pounds.

3. Many things are sold by weight.

Butter is sold by weight. You can buy a pound, a part of a pound, or more than a pound.

Sugar is sold in 1-pound boxes, 5-pound bags, and still heavier bags.

On a sugar sack you read *5 lb.* *5 lb.* means 5 pounds.

The letters, *lb.*, stand for pounds. Most letters that stand for words are found in the word, but the letters *lb.* are different.

If there were no scales, how could you tell which child in your room is heaviest?

FINDING THE FACTS

A. Read a problem carefully.

B. Tell what it asks.

C. Look for the facts you need.

D. Decide what to do.

E. Then work the problem.

1. How much did John gain this year? He weighs 63 lb. Last year at this time he weighed 56 lb.

2. Sandra is 51 in. tall. Her sister is 56 in. tall. Who is taller? How much taller is she?

3. How many yards wide is a classroom? It measures 27 ft. wide.

4. It is 9 miles to the waterfall. How long will it take to hike that far if you hike 3 miles in one hour?

5. How many inches long will a board need to be to make all 4 sides of a box? The box is 12 inches long and 6 inches wide.

6. Joe is 56 in. tall and weighs 78 lb. Sam is 52 in. tall and weighs 65 lb. Jerry is 51 in. tall and weighs 77 lb.

a. Which is tallest? heaviest?

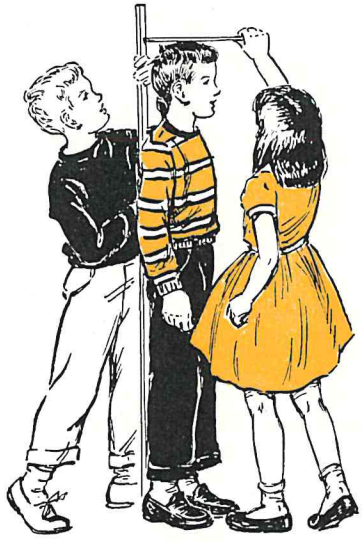
b. How much do the three boys weigh all together?

c. How many inches taller than Jerry is Sam?

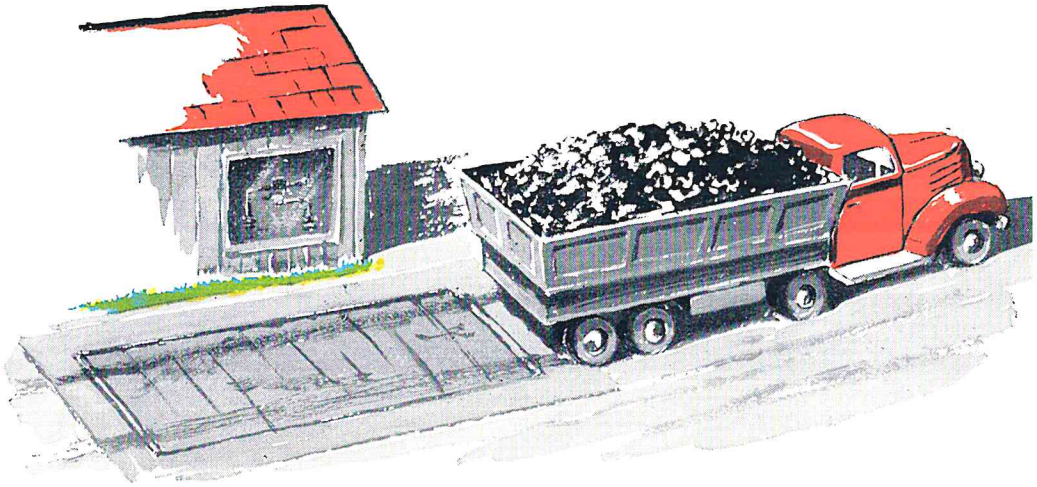
d. How much will Sam have to gain to be as heavy as Jerry is now?

e. How many inches taller than a yard is Sam?

f. Is Jerry over 4 ft. tall?



7. Write everything that you know about 4. On page 99 you can see what Dan wrote about 5.



WEIGHING VERY BIG THINGS AND VERY LITTLE THINGS

1. This truckload of coal has just been weighed. Coal is very heavy. Big loads are weighed on these scales. You can see through the window the part of the scales you read.

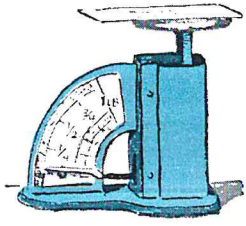
2. Do you know anything that weighs a ton? In most states, a ton is 2000 pounds.

a. A truckload of coal may weigh 3 or 4 tons.

b. Big automobiles weigh about 2 tons. How many pounds is that?

c. Two horses may weigh more than a ton. One very big horse may weigh a ton.

d. It takes 10 big men to weigh a ton.



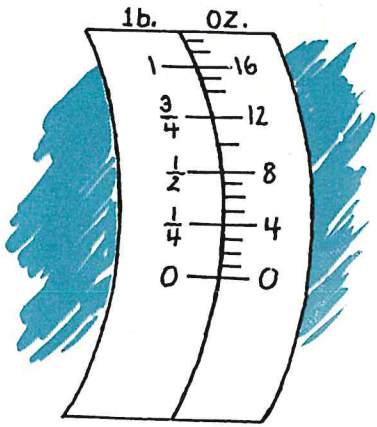
3. Some things are very light. A letter is very light. Letters often weigh less than 1 ounce. It takes 16 ounces of letters to weigh a pound. Sixteen ounces of most things you buy make 1 pound.

How much does a stamp cost for a letter that weighs 1 ounce?

READING SCALES

The short way to write **ounce** is **oz.**

16 ounces (oz.) = 1 pound (lb.)
2000 pounds (lb.) = 1 ton (T.)



Sometimes a person may buy a half pound or a quarter pound of meat. The clerk's scales are marked as shown at the right.

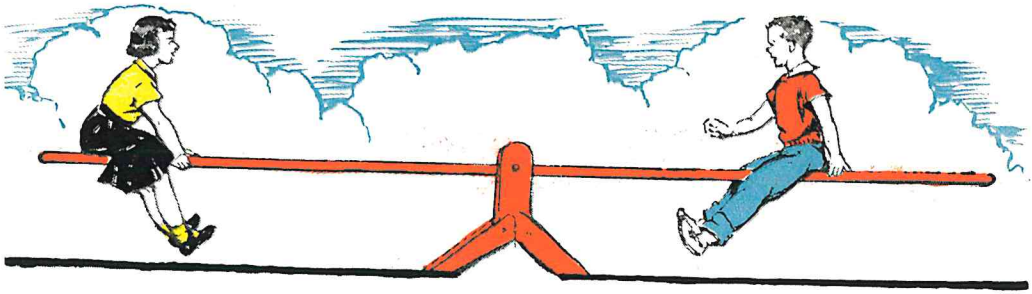
1. How many ounces equal a quarter pound? a half pound?

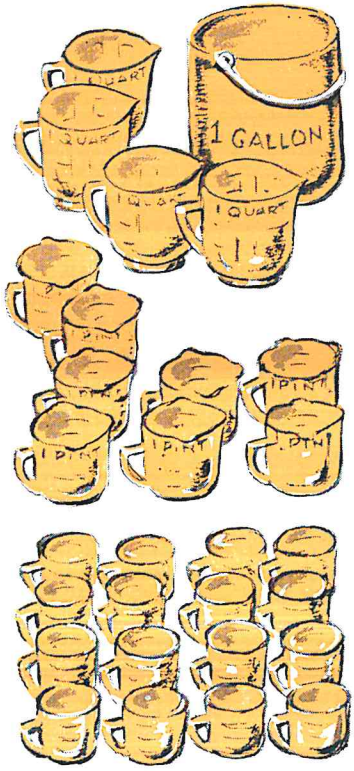
2. Mother said to the clerk, "Please give me a pound and a quarter of fish." How many ounces more than a pound is that?

3. Tom buys $\frac{3}{4}$ lb. of hamburger. Find on the scales the number of ounces he buys.

Which is heavier, the pail of sand or the pail of leaves?

This seesaw won't move until Ann or Bob moves. They just balance. Is Bob heavier than Ann? If Ann moves in, will she go up or down?





MEASURING LIQUIDS

1. Ruth says we need 12 quarts of lemonade for our Christmas party. Linda says we need at least 3 gallons. How many quarts fill a gallon? Pour quarts of water into a gallon to see.

What part of a dollar is a quarter? How do *quart* and *quarter* help you remember that a gallon is 4 quarts?

2. Can you pour 2 pints into a quart measure and fill it?

3. How many pints are there in one gallon? There are 2 pints in one quart and 4 quarts in one gallon.

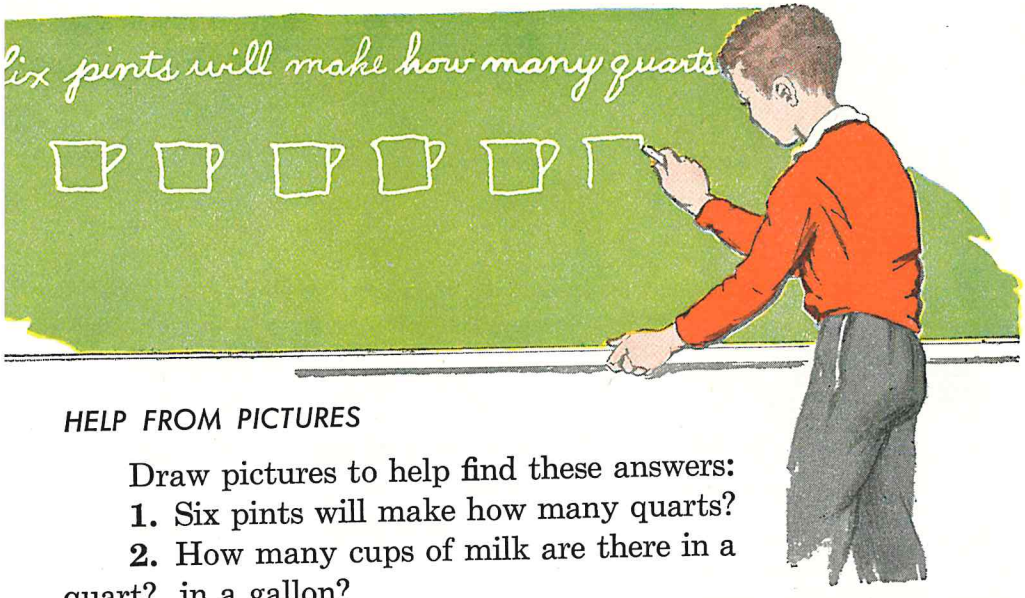
4. How many measuring cups fill a pint? Is a cup a half pint?

2 cups = 1 pint (pt.) 2 pints (pt.) = 1 quart (qt.)
4 quarts (qt.) = 1 gallon (gal.)

5. Mother has been canning fruit. One shelf of peaches looks like the row below. Can you tell how much canned fruit is shown here? How many quarts? gallons?

6. Name all the things you can that are sold by the pint, or the quart, or the gallon.

Did you think of gasoline and ice cream?



HELP FROM PICTURES

Draw pictures to help find these answers:

1. Six pints will make how many quarts?

2. How many cups of milk are there in a quart? in a gallon?

3. Ned's father says his car engine holds 5 quarts of oil. He has a gallon of oil. How much more oil does he need to fill his engine?

4. If a pint of ice cream serves 3 children, how many children will 2 quarts serve? Be sure to draw a picture for this one. It may fool you.

5. Which is more, a half gallon or three pints?

GROWTH TEST

Watch the signs. Use an answer sheet.

1	2	3	4	5
3×320	$90 - 24$	$29 + 79$	$\frac{1}{4}$ of 80	6×25
6	**7**	**8**	**9**	**10**
$32 + 9 + 56$	$172 - 83$	$104 - 68$	3×417	$240 \div 6$
11	**12**	**13**	**14**	**15**
$279 \div 9$	$8 + 2 + 6 + 4$	8×35	$981 - 683$	$679 + 974$
16	**17**	**18**	**19**	**20**
$168 \div 4$	$66 + 6 + 398$	$400 \div 5$	4×79	$570 - 493$

PLANNING A CHRISTMAS PARTY

The fourth grade boys and girls are planning a Christmas party. They are inviting their parents to it. There will be a job for everyone to do. Does planning a party take good thinking?

1. There are 32 mothers and 32 fathers of children in the room. All have been invited. Only 7 of the mothers cannot come. How many mothers plan to be there?

2. Only 16 of the fathers plan to come. If 16 fathers and 25 mothers come, how many parents will be there?

3. How many more chairs will be needed if only 41 parents come? There are 29 chairs in the room now.

4. The teacher, 36 children, 16 fathers, and 25 mothers will make how many people all together?

5. Each person is to have one cupcake and some ice cream. Carol's mother will bake 24 cakes, Rita's 18, Lynn's 24, and Diane's 18.

a. Will that be enough cakes for 78 people?

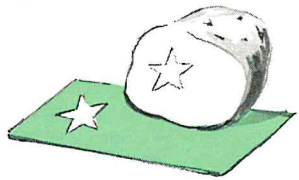
b. Will there be any cakes left? How many?

6. Mike and Jim are making paper chains. It takes 4 sheets of colored paper to make one yard of chain. How many sheets are needed for 12 yards of chain?

7. Will 4 dozen sheets of paper be the same as 48?

8. Miss Bell, the teacher, says it takes one can of juice to make punch for 10 people. Will 8 cans be enough for 78 people? Should the class buy more to be sure?

9. The children will cut potatoes into halves to make gift designs. If each child has 4 designs, how many whole potatoes will he need for his 4 designs?



PRACTICE

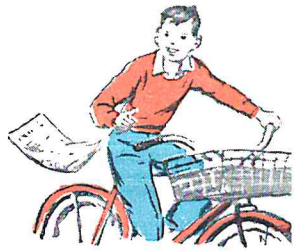
Write the answers on paper folded up and down:

	a	b	c	d	e	f
1.	4×3	2×7	9×3	$9 \div 3$	$15 \div 3$	$24 \div 4$
2.	6×4	4×8	8×5	$20 \div 5$	$24 \div 3$	$40 \div 5$
3.	5×7	3×4	4×9	$16 \div 2$	$28 \div 4$	$36 \div 4$
4.	8×2	5×6	5×8	$35 \div 5$	$45 \div 5$	$27 \div 9$
5.	4×5	9×2	4×6	$24 \div 6$	$20 \div 4$	$45 \div 5$
6.	3×3	4×7	3×7	$12 \div 4$	$18 \div 3$	$32 \div 8$
7.	2×9	3×6	9×4	$30 \div 6$	$28 \div 7$	$27 \div 3$
8.	5×3	5×4	7×2	$16 \div 4$	$18 \div 2$	$35 \div 7$
9.	6×2	9×5	7×5	$40 \div 8$	$30 \div 5$	$14 \div 2$
10.	5×8	7×4	3×9	$12 \div 6$	$12 \div 3$	$45 \div 9$
11.	4×4	3×8	8×4	$15 \div 5$	$32 \div 4$	$24 \div 8$
12.	6×5	3×5	5×9	$18 \div 2$	$21 \div 7$	$21 \div 3$

THE SIXES

SIXES WE KNOW

1 six is	6	6 ones are	6	$6 \div 6 = 1$	$6 \div 1 = 6$
2 sixes are	12	6 twos are	12	$12 \div 6 = 2$	$12 \div 2 = 6$
3 sixes are	18	6 threes are	18	$18 \div 6 = 3$	$18 \div 3 = 6$
4 sixes are	24	6 fours are	24	$24 \div 6 = 4$	$24 \div 4 = 6$
5 sixes are	30	6 fives are	30	$30 \div 6 = 5$	$30 \div 5 = 6$



1. How many papers does Jerry carry in a week? He carries 30 papers a day for 6 days a week.

2. How much will 30 papers sell for at 5¢ each?

3. If 5 papers weigh a pound, how heavy will 30 papers be? Is that very heavy to carry?

4. Jerry sells his papers for \$1.50. He pays \$1.10 for them. How much does he keep from \$1.50?

5. Jerry earns a quarter, a dime, and a nickel each day. Add 6 quarters, 6 dimes, and 6 nickels to see what Jerry earns in a week.

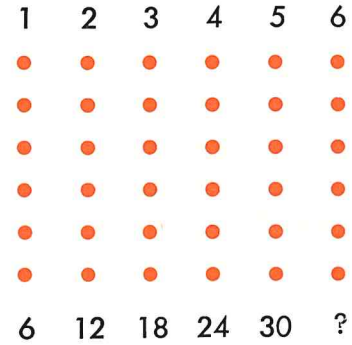
Write the answers on folded paper:

6.	6	6	6	6	6	6	6
	×5	×3	×1	×4	×2	×5	×3
7.	2	5	8	3	1	9	4
	×6	×6	×3	×6	×6	×4	×6

8. Look at the table of fours on page 106. Write all five families of six that are at the top of this page the way the fours are written.

6 SIXES

Count the dots in 5 columns. Five sixes are 30. Another column of six dots makes how many dots? 6 sixes are ___?___. Do 6 sixes make a square?



1. You can do interesting things with a square of sixes. Make six rows of dots with six dots in each row.

a. Divide the dots into 3 equal groups by drawing lines across the square. How many are in each group?

b. How many dozen are in 36?

2. Make another square of 36 dots. Divide 36 in the middle by drawing a line down from the top. Divide the square again with a line across at the middle.

a. How many quarters did you make?

b. How many dots are there in each quarter?

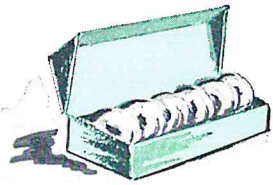
c. How many nines are there in 36?

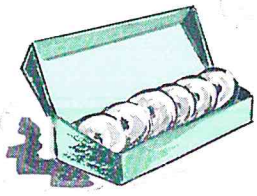
d. What is $\frac{1}{4}$ of 36?

Answer these on folded paper:

	a	b	c	d	e	f	g	h
3.	$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$
4.	$\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$
5.	$6\overline{)36}$	$3\overline{)27}$	$4\overline{)24}$	$4\overline{)36}$	$7\overline{)28}$	$4\overline{)32}$	$5\overline{)30}$	$9\overline{)36}$
6.	$8\overline{)32}$	$6\overline{)30}$	$4\overline{)28}$	$6\overline{)18}$	$6\overline{)24}$	$7\overline{)21}$	$3\overline{)24}$	$3\overline{)21}$

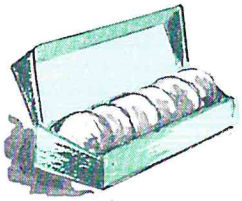
What is the price of a dozen large eggs?
What is the price of a dozen doughnuts?





BUYING BY THE DOZEN

1. How many are in a dozen? Is the number in a dozen always the same? How many are 2 dozen? 3 dozen? 4 dozen? 5 dozen?

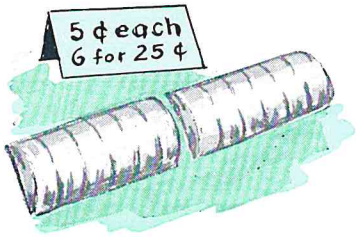


2. How many is a half dozen? How many sixes are there in a dozen? How many sixes are there in 2 dozen? in 3 dozen? in 4 dozen? in 5 dozen?

3. Barbara can buy a package of 6 buns for 18¢. How much does each bun cost?

4. Doughnuts are often sold in boxes of a half dozen. How many of these boxes make 2 dozen?

How many doughnuts are there in 3 boxes? in 6 boxes? in 4 boxes?



5. Is it cheaper to buy doughnuts at 6¢ each or at 35¢ for a box of a half dozen?

6. Candy bars are sometimes 5¢ each or 6 for a quarter. How much do 6 bars cost at 5¢ each?

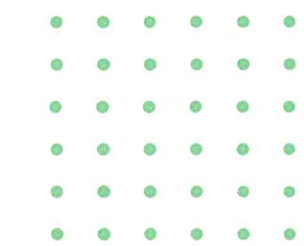
7. How much does each bar cost if you pay 30¢ for 6? if you pay 24¢ for 6? if you pay 36¢ for 6? if you pay 18¢ for 6?

8. How much does a half dozen pencils cost at 4¢ each? at 6¢ each? at 5¢ each?

7 SIXES AND 8 SIXES
6 SEVENS AND 6 EIGHTS

Count the sixes below.
Add them.

SIXES



6 sixes = 36
One more → 6
7 sixes = 42
Another → 6
8 sixes = 48

$7 \times 6 = 42$
$8 \times 6 = 48$

$6 \times 7 = 42$
$6 \times 8 = 48$

Make a table of sixes

$1 \times 6 =$
$2 \times 6 =$
$3 \times 6 =$
$4 \times 6 =$
$5 \times 6 =$
$6 \times 6 =$
$7 \times 6 =$
$8 \times 6 =$

1. How many are 5 sixes? 6 sixes?

2. If 6 sixes are 36, then 7 sixes are $36 + 6$. $36 + 6 = ?$

3. How many days are there in 6 weeks?

4. What is the difference between 42 and 48?

5. Write the other multiplication fact and two division facts of the family of 7×6.

6. Write the other multiplication fact and two division facts of the family of 8×6.

7. What is $\frac{1}{6}$ of 48? $\frac{1}{7}$ of 42? $\frac{1}{8}$ of 48? $\frac{1}{6}$ of 42?

8. Copy and answer:

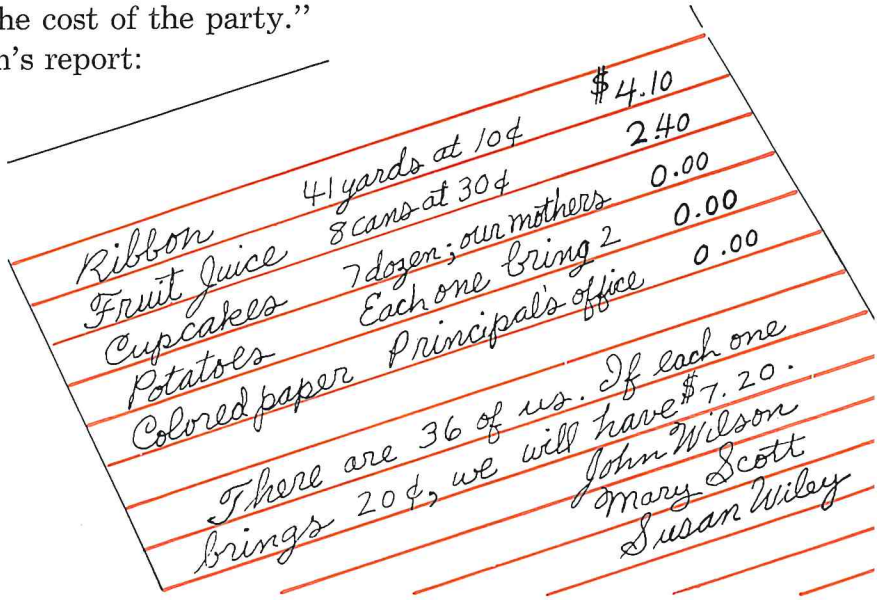
a. $\begin{array}{r} 74 \\ \times 6 \\ \hline \end{array}$ **b.** $\begin{array}{r} 61 \\ \times 8 \\ \hline \end{array}$ **c.** $\begin{array}{r} 63 \\ \times 7 \\ \hline \end{array}$ **d.** $\begin{array}{r} 82 \\ \times 6 \\ \hline \end{array}$ **e.** $6\overline{)426}$ **f.** $8\overline{)488}$ **g.** $7\overline{)427}$ **h.** $6\overline{)486}$

THE COST OF THE CHRISTMAS PARTY

CLASS PRESIDENT:

"The meeting will please come to order. John will tell us the cost of the party."

John's report:


Ribbon 41 yards at 10¢ $4.10
Fruit Juice 8 cans at 30¢ 2.40
Cupcakes 7 dozen; our mothers 0.00
Potatoes Each one bring 2 0.00
Colored paper Principal's office 0.00
There are 36 of us. If each one brings 20¢, we will have $7.20.
John Wilson
Mary Scott
Susan Wiley

CLASS PRESIDENT: "Thank you, John.
Bill, do you want to ask something?"

BILL: "I thought we were going to have ice cream."

JOHN: "We won't have enough money for ice cream."

1. What will both the ribbon and fruit juice cost?

2. Will that be more or less than $7.20? How much?

3. Mary and Susan say it will take 5 half-gallon packages of ice cream for the party. Each package costs $1.00. How much will the ice cream cost?

4. Do the children have enough money for fruit juice and ice cream?

5. Do you think it would be better to have ribbon for the presents or ice cream to eat? Why?

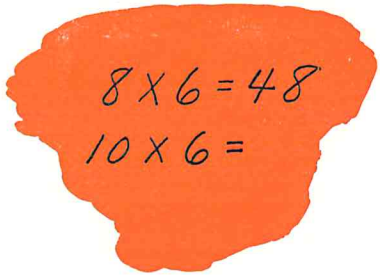
6. Multiply by 6: $2.10 $7.15 $3.14 $9.00 $.48

9 SIXES AND 6 NINES

How many are 9 sixes?

Write the answer for 8×6 on the chalkboard.

How many are 10 sixes? Are 10 sixes the same as 6 tens? Write the answer for 10×6 below the 48 on the chalkboard.



Are 9 sixes 6 more than 8 sixes?

Are 9 sixes 6 less than 10 sixes?

Are 9 sixes $48 + 6$? $60 - 6$?

Do 9 sixes $= 54$?

Do 6 nines $= 54$?

Say the answers:

1.	$54 \div 6 =$	$54 \div 9 =$	$\frac{1}{6}$ of $54 =$	$\frac{1}{9}$ of $54 =$
2.	$48 \div 6 =$	$48 \div 8 =$	$\frac{1}{6}$ of $48 =$	$\frac{1}{8}$ of $48 =$

Write the products on folded paper:

	a	b	c	d	e	f	g	h
3.	6	3	6	9	6	8	6	7
	4	6	7	6	5	6	9	6
4.	6	9	3	4	6	7	9	6
	8	4	7	6	9	5	3	6

Write the quotients on folded paper:

5.	$6\overline{)30}$	$3\overline{)18}$	$6\overline{)42}$	$9\overline{)54}$	$3\overline{)24}$	$8\overline{)48}$	$6\overline{)18}$	$4\overline{)36}$
6.	$6\overline{)48}$	$4\overline{)24}$	$8\overline{)32}$	$6\overline{)36}$	$3\overline{)21}$	$3\overline{)27}$	$4\overline{)28}$	$6\overline{)54}$
7.	$7\overline{)42}$	$9\overline{)36}$	$5\overline{)45}$	$4\overline{)20}$	$8\overline{)40}$	$4\overline{)16}$	$7\overline{)35}$	$4\overline{)12}$

USING SIXES

The boys and girls in Miss Clark's room made up their own problems about the way they use sixes. Here are some of the ways. Can you work the problems?

1. Jack wants to give 3 cookies to each of his 6 friends. How many cookies will he need?

2. Bob sells 9 tickets to his back yard magic show for 6¢ each. How much money is that?

3. If apples cost 6¢ each, how much will 7 apples cost?

4. If Bill's mother pays 48¢ for 6 bars of soap, how much does one bar cost?

5. Jane is making 6 dresses for each of her 4 paper dolls. How many dresses will she make?

6. How many stamps can Sue buy for 54¢ if each stamp costs 6¢?

7. Mrs. Smith wants to buy the paper flowers Judy made. She will pay 6¢ each. What will she pay for 6 flowers?

8. Mary picks 30 flowers. She wants to make 6 bunches. How many will there be in each bunch?

9. Make some problems of your own which use the number 6.

10. Write all you know about 6. See page 99.

Prove that a horse has 6 legs.

Answer: Forelegs in front, and 2 behind.

UNIT TEST

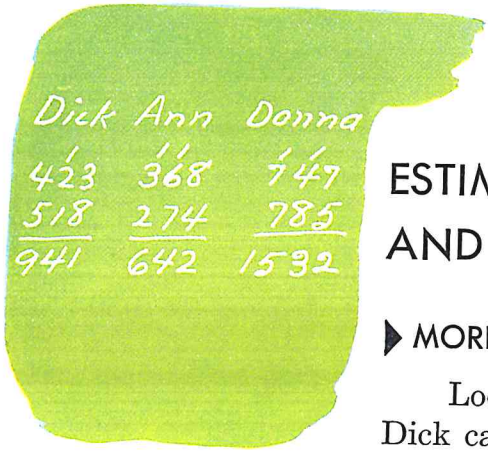
	a	b	c	d	e	f
1.	$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$
2.	$4\overline{)24}$	$8\overline{)48}$	$6\overline{)36}$	$6\overline{)54}$	$7\overline{)42}$	$6\overline{)30}$
3.	$\begin{array}{r} 60 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 61 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 92 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 816 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 416 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 301 \\ \times 6 \\ \hline \end{array}$
4.	$6\overline{)60}$	$2\overline{)120}$	$6\overline{)246}$	$6\overline{)360}$	$3\overline{)189}$	$6\overline{)426}$
5.	$5\overline{)300}$	$9\overline{)540}$	$7\overline{)427}$	$6\overline{)480}$	$6\overline{)546}$	$8\overline{)488}$

A TABLE OF MULTIPLICATION FACTS

Below is a table of multiplication facts you have learned so far. Study it if you need help.

The way to use the table is to find the number you multiply by at the left. The number you multiply is above the table. The number where a row and a column meet is the product.

	0	1	2	3	4	5	6	7	8	9	10
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42				
8	0	8	16	24	32	40	48				
9	0	9	18	27	36	45	54				



ESTIMATING IN ADDITION AND SUBTRACTION

▶ MORE ABOUT CARRYING

Look at the examples above. Did Dick carry a ten in his example? Did Ann carry a ten and a hundred? When Donna added her hundreds, did she have 15 of them?

	Thousands	Hundreds	Tens	Ones
DICK		9	4	1
ANN		6	4	2
DONNA	1	5	3	2

Donna read her answer in two ways. She said, "Fifteen hundred thirty-two" and "One thousand, five hundred thirty-two." Both ways are right.

How many ones make a ten?
How many tens make a hundred?
How many hundreds make a thousand?

You can read these numbers this way:

3587 "Three thousand, five hundred eighty-seven."
"Thirty-five hundred eighty-seven."

6820 "Six thousand, eight hundred twenty."
"Sixty-eight hundred twenty."

7409 "Seven thousand, four hundred nine."
"Seventy-four hundred nine."

5032 "Five thousand, thirty-two."
In numbers like 5032, it is easier to say **five thousand** than to say **fifty hundred.**

How would you read **1206**?
How would you read **7008**?
How should you read **20,488**?

READING NUMBERS

Read these numbers:

	a	b	c	d	e	f
1.	476	584	391	406	930	810
2.	1482	1695	1576	8943	7640	5780
3.	5603	9402	6423	8210	9603	7402
4.	5074	6039	8020	4016	5050	9033
5.	6007	8004	1024	2304	4002	1066
6.	12,458	11,552	15,420	13,925	14,617	16,507

Write these numbers:

7. One thousand, two hundred twenty-four
8. Fifty-four hundred seventeen
9. Three thousand, five hundred two
10. Six thousand, ninety-eight
11. Fourteen hundred ninety-six
12. Seven thousand, four hundred ten
13. Eighty-five hundred

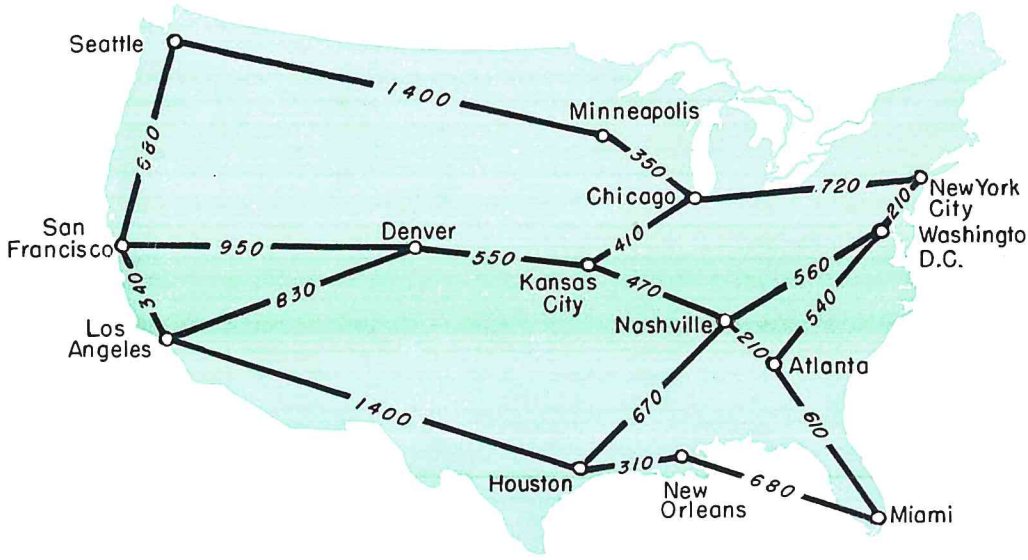
PRACTICE

Find the sums:

1. 163 478	2. 375 186	3. 245 678	4. 358 396	5. 346 284	6. 276 455
7. 478 249	8. 699 233	9. 524 397	10. 335 488	11. 466 488	12. 345 167
13. 582 673	14. 835 347	15. 845 779	16. 583 546	17. 396 597	18. 879 814

19. $7 + 75 + 8 + 86$

20. $367 + 99 + 579$



AIRLINE DISTANCES

1. Carol lives in Denver. How many miles is Denver from Kansas City?

2. How far is Kansas City from Chicago?

3. If Carol flies 550 miles to Kansas City and 410 miles to Chicago, how far will that be all together?

4. How far would Carol fly from Denver to Kansas City to Nashville to Atlanta?

5. How far is it from San Francisco to Denver to Kansas City?

6. How far is it from New York City to Denver if you go through Chicago and Kansas City?

7. How far is it from Atlanta to New York City? What is the distance from Seattle to Los Angeles?

8. Would a flight from Los Angeles to New York City that did not stop, go closer to Kansas City or Nashville?

9. Make a trip you would like to take. How far is it?

HOW FAR IS IT?

1. Add these distances by airline from:

Miami to Kansas City	San Francisco to Chicago	Los Angeles to Miami	New York to Denver
610	950	1400	720
210	550	310	410
470	410	680	550

2. Bill is going to fly from Washington to Nashville to Atlanta and back to Washington. Copy and add 560, 210, and 540. How far will he fly?

3. If Bill flies the other way, from Washington to Atlanta to Nashville to Washington, how far will he fly? Write the numbers and compare the distances.

4. Add these. Compare the sums of the two examples under each letter. Why do you get the same answer?

a		b		c		d	
687	453	598	737	642	379	819	527
453	687	737	598	379	642	527	819

5. Write these numbers and add. Then start with the last number and add again.

a. 256 + 374 + 121 **c.** 476 + 543 + 212
b. 368 + 547 + 222 **d.** 564 + 653 + 211

• When you add, no matter which number you start with, you get the same answer.

6. Add these numbers downward. Then add them upward.

a	b	c	d	e	f	g
724	547	213	686	405	405	614
405	213	547	213	552	724	213
408	408	215	547	956	215	686

ANSWER STRIP PRACTICE Use Set 1, page 143.

ESTIMATING IN ADDITION

Martha is estimating a distance on a road map. She says, "4 and 3 are 7, and another ten is 8; about 80." She is adding 49 miles and 30 miles. Tell how she is estimating.

To **estimate** means to make a good judgment, or to reason out a sensible answer, without doing all of the figuring.

Martha adds the tens' column, 4 + 3, and she sees about 1 more ten in the ones' column. This makes 8 tens. So Martha says the sum is about 80.

$$\begin{array}{r} 49 \\ \underline{30} \end{array}$$

The sums below have been estimated. Without pencil, estimate each and choose the best estimate from the three numbers below. Write your estimate for each sum on an answer sheet, and then add with pencil to check it.

1.	**2.**	**3.**	**4.**	**5.**
41	30	61	160	300
64	29	60	88	450
33	40	31	10	650
a. 130	**a.** 80	**a.** 150	**a.** 240	**a.** 1400
b. 140	**b.** 90	**b.** 160	**b.** 250	**b.** 1500
c. 150	**c.** 100	**c.** 170	**c.** 260	**c.** 1600

6. Is 19 + 22 more or less than 40?

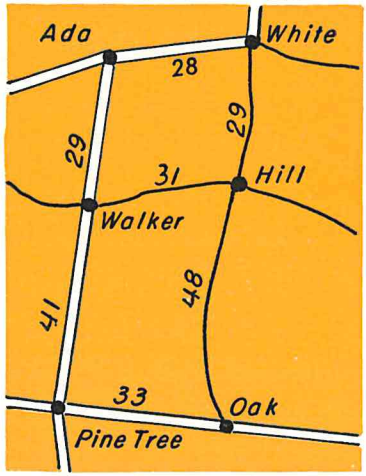
7. Is 95 + 104 more or less than 200?

8. Is 48 + 53 more or less than 100?

9. Is 28 + 33 more or less than 60?

ESTIMATING ON A ROAD MAP

A ROAD MAP



Numbers show miles

Estimate the answers to the nearest ten. For example, if a real answer is 38 or 43, the nearest ten is 40.

No pencils, please!

1. Estimate the distance between:

- **a.** Ada and Pine Tree
- **b.** Oak and White
- **c.** Pine Tree and Hill through Walker

2. Is it farther from Walker to White through Ada or through Hill?

3. Is it farther from Ada to Hill through Walker or through White?

ESTIMATING IN SUBTRACTION

1. The distance to Ocean City is 80 miles; to Milltown is 59 miles. Is the difference about 20, 30, or 40 miles? George reasons that 59 is about 60. The difference between 60 and 80 is 20.

2. The largest boy in a class weighs 91 lb. The smallest weighs 58 lb. About what is the difference?

Dorothy thinks of 91 as 90 and 58 as 60. So she estimates the difference to be 30.

3. Estimate the difference to the nearest ten between:

a. 50 and 79	**e.** 29 and 61	**i.** 98 and 140
b. 31 and 52	**f.** 48 and 87	**j.** 62 and 101
c. 90 and 28	**g.** 61 and 98	**k.** 59 and 120
d. 77 and 36	**h.** 19 and 80	**l.** 149 and 251

ESTIMATING MONEY

1. Margaret has \$2.00. If she spends 98¢ for Christmas cards, will she have a dollar left?

2. Roy is buying 4 tickets for a basketball game. The tickets are 48¢ each. About how many dollars will Roy need? *Is 48¢ about a half dollar*?

3. Tickets for a movie are 24¢. How many dollars are needed to buy 8 tickets?

4. Estimate the cost of 5 tickets at 98¢ each.

5. If a pair of shoes costs \$5.95, about how many dollars will 3 pairs cost?

6. One pair of shoes costs \$4.95 and another pair costs \$8.00. About how many dollars is the difference?

7. Estimate the cost of 3 shirts at \$1.95 each.

8. Estimate the cost of a dress at \$4.95 and a pair of shoes at \$5.95.

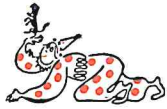
9. Estimate the cost of 6 hamburgers at 18¢ each.

10. Estimate the cost of 5 quarts of oil at 49¢ a quart.

11. How many dollar bills are needed to buy meat at \$3.06 and groceries at \$4.90?

12. Will a ten-dollar bill pay for purchases of \$2.95, \$3.98, and \$3.97?

13. Three classes paid \$2.90 each for food for a school party. Estimate the total cost for all 3 classes.



Estimate the cost of:

a. a dozen candy bars at 3 bars for 19¢

b. two dozen Christmas cards at 2 cards for a quarter

DO YOU KNOW THE MEASURES?

Choose the right answer:

1. Milk is most often measured by –
a. quarts **b.** feet **c.** inches **d.** yards

2. Butter is sold by the –
a. gallon **b.** pint **c.** pound **d.** quart

3. Sugar in bags is sold by the –
a. piece **b.** pint **c.** pound **d.** inch

4. The distance from one town to another town is measured by –
a. inches **b.** tons **c.** gallons **d.** miles

5. You buy shoes by the –
a. ounce **b.** yard **c.** pair **d.** quart

6. Most often you buy candy by the –
a. gallon **b.** inch **c.** piece **d.** yard

7. Bicycles might sell for $45 –
a. per pound **b.** per gallon **c.** per inch **d.** each

8. A loaf of bread weighs nearest –
a. a pound **b.** a ton **c.** an ounce **d.** 5 pounds

9. Which is most often used for selling pencils?
a. an ounce **b.** a dozen **c.** a pint **d.** a foot

10. The weight of children is told by –
a. yd. **b.** ft. **c.** qt. **d.** lb.

11. Gasoline is measured by the –
a. gal. **b.** ft. **c.** oz. **d.** in.

12. How tall are you? **a.** a yard
b. more than a yard **c.** less than a yard

ANSWER STRIP PRACTICE

Use Set 2, page 143.

HOW WELL DO YOU KNOW?

Use an answer sheet. Number it from 1 to 13.

Write the answer for each of these examples beside the number on the answer sheet:

1. Which of these equals a dime?

$1.00 25¢ 5¢ 10¢

2. Which of these is the most money?

$0.25 $0.60 75¢ 69¢

3. A quarter is worth how many nickels?

4. A half dollar is worth how many dimes?

5. Write the largest number you can by using 2, 4, 6, and 8 once each.

6. In which of these numbers is the 6 in the tens' place?

6473 4637 3764 7436

7. Write a number which is the same as 5 hundreds and 3 ones.

8. Copy the smallest of these numbers:

98 101 980 100

9. What number comes next?

3 6 9 ?

10. Which is the smallest fraction? $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$

11. Which number is six thousand, five hundred four?

654 6540 6504 6054

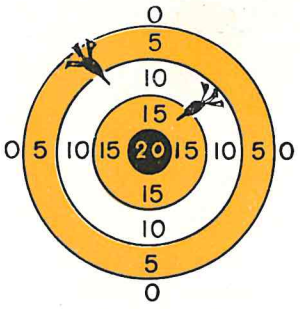
12. Which number has the most thousands?

973 4325 3946 879

13. About how high is your teacher's desk?

$1\frac{1}{2}$ ft. 30 in. $1\frac{1}{2}$ yd. 3 yd.

ESTIMATING IN PROBLEMS



Read a problem. Estimate its answer. Work the problem.

1. How many points is Bill ahead of John in the dart game? Bill has a score of 420 points. John's score is 380 points.

2. Edith weighs 69 pounds. Her big sister weighs 120 pounds. How many pounds less does Edith weigh?

3. Bob and Bill are on a hunting trip with their father. The first day they went 311 miles. The second day they had car trouble and went only 240 miles. How much farther did they go the first day?

4. How much money will Joan have left? Her aunt gave her \$5.00 for her birthday. She plans to spend \$3.98 of it for a puppet set.

5. How much change should Sally's mother receive? She gives \$10.00 to pay for a pair of shoes that costs \$6.75.

6. Dick wants to buy a football. He sees one on sale for \$1.98. A price of \$2.29 is crossed out. How much money can Dick save by buying the football on sale?

7. Tom earns \$5.75 working at a store. If he puts \$2.98 in his savings bank, how much will he have left to spend?

8. In September, Mother had 130 cans of fruit on the shelf. By January the family had used 58 cans. How much fruit was left?

9. Last month Judy's father drove his car 950 miles. This month he drove it 875 miles. What is the difference between the numbers of miles he drove in the two months?

ANSWER STRIP PRACTICE

Use Set 3, page 143.

HOW WELL CAN YOU ESTIMATE?

The sums and differences below have been estimated. Choose the best estimate from the three at the right of each example. Then work with pencil to check your choice.

1. 31	**a.** 80	**2.** 79	**a.** 30	**3.** 85	**a.** 50
40	**b.** 90	−40	**b.** 40	−26	**b.** 60
29	**c.** 100		**c.** 50		**c.** 70
4. 18	**a.** 90	**5.** 120	**a.** 170	**6.** 129	**a.** 30
39	**b.** 100	+59	**b.** 180	−90	**b.** 40
37	**c.** 110		**c.** 190		**c.** 50
7. 59	**a.** 140	**8.** 151	**a.** 90	**9.** 98	**a.** 90
81	**b.** 150	−62	**b.** 100	97	**b.** 200
17	**c.** 160		**c.** 110	10	**c.** 300

GROWTH TEST

1. Multiply 45 × 4	**2. Subtract** 914 − 760	**3. Add** 537 + 893	**4.** 501 × 6	**5.** $3\overline{)240}$
6. 534 − 79	**7.** $\frac{1}{5}$ of 35	**8.** 3 × 529	**9.** 7 + 7 + 8 + 6	**10.** 263 − 168
11. 284 + 97 + 9	**12.** 4 × 98	**13.** $6\overline{)366}$	**14.** 540 − 496	**15.** 455 + 787 + 659
16. 320 ÷ 8	**17.** 808 + 736 + 386	**18.** 405 − 328	**19.** $4\overline{)248}$	**20.** 6 × 38

ADDITIONS FOR AN ANSWER STRIP

Study the additions first. Write the answer as your teacher reads the question. If you don't know the answer, mark the space. (Time: 6 sec. between items. Later, 4 sec.)

Set 1. Read down.

(1)	(6)	(11)	(16)	(21)
14 and 2	25 and 4	27 and 8	24 and 7	21 and 9
16 and 8	16 and 5	36 and 3	27 and 5	33 and 7
12 and 7	28 and 4	31 and 9	19 and 3	27 and 4
23 and 6	36 and 7	17 and 6	25 and 8	25 and 9
19 and 2	39 and 6	25 and 6	29 and 6	38 and 2

Set 2

(1)	(6)	(11)	(16)	(21)
12 and 4	25 and 5	25 and 8	17 and 6	36 and 7
24 and 9	12 and 6	37 and 7	28 and 5	23 and 9
37 and 3	29 and 9	28 and 8	33 and 7	17 and 8
28 and 9	27 and 4	14 and 7	34 and 8	28 and 6
19 and 4	16 and 6	26 and 5	25 and 6	19 and 7

Set 3

(1)	(6)	(11)	(16)	(21)
12 and 5	25 and 9	17 and 5	24 and 6	26 and 9
13 and 8	28 and 7	29 and 6	12 and 7	37 and 3
24 and 4	29 and 9	18 and 4	34 and 5	32 and 9
15 and 7	26 and 8	27 and 9	29 and 8	23 and 5
19 and 4	18 and 9	19 and 5	19 and 3	34 and 9

Set 4. Use with page 147.

(1)	(6)	(11)	(16)	(21)
22 and 8	34 and 6	18 and 8	19 and 7	17 and 7
33 and 6	15 and 7	26 and 9	38 and 6	29 and 8
24 and 7	26 and 8	34 and 8	29 and 9	25 and 9
15 and 8	28 and 9	16 and 7	28 and 7	19 and 6
27 and 9	17 and 6	27 and 8	34 and 9	35 and 6

UNIT 13

PROBLEM SOLVING

ASKING PROBLEM QUESTIONS

TRICKS LIVES IN THE CITY

Bob and Betty have cousins in the country. They will take Tricks with them to see their cousins.

Tricks eats mostly canned dog food.

What do the children need to know to tell how many cans of food to take for Tricks?

1. Here is the way Bob thinks: "We'll be at the farm 2 weeks. Two weeks are 14 days. Tricks eats one can of food in two days." Tell the class how you would find out how many cans of food to take.

2. Make up a problem about the cost of food for Tricks.

3. Ask the class a question about feeding two dogs.

4. Ask the class questions about how far Tricks will ride in a car.

5. Ask some questions about the distance to the cousins' home.

6. Ask some questions about the time it takes to go to the cousins' home.

7. Plan the whole trip. What do you need to know? What do you need to find out?

TELLING PROBLEM STORIES

SHEP LIVES IN THE COUNTRY

Jack and Jean have a big Collie dog named Shep. He gets the cows for them. Is that a trick?

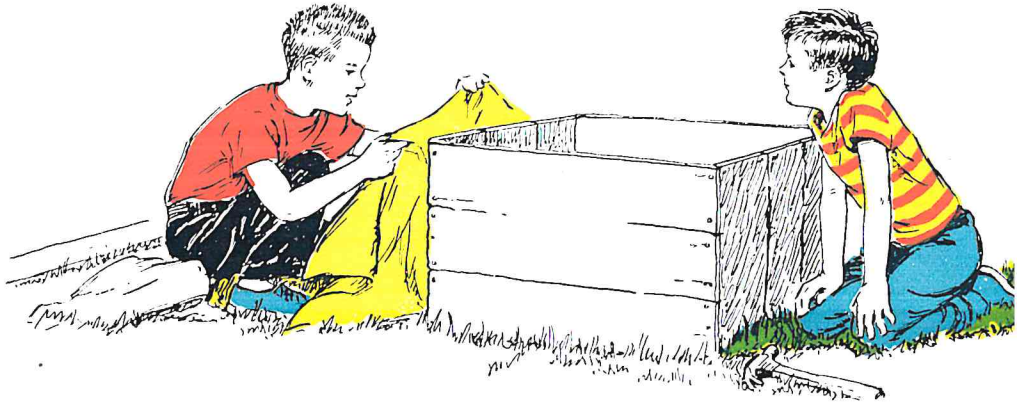
Say these problems in your own words. Tell the class what you want to find out and what you know.

1. Shep is a big Collie. He weighs 30 lb. Tricks weighs only 10 lb. Ask a question about the weight of the two dogs.

2. Suppose Tricks gets away from Bob on the farm and becomes lost. How long will it take him to go 100 miles back home, if he goes 25 miles each day? Do this problem by adding.

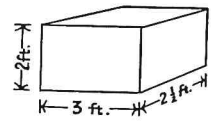
3. Shep brings the cows from the pasture. It takes Shep about 5 minutes to go to the cows, and the cows take 15 minutes to come all the way from the pasture. Compare the speed of Shep and the speed of the cows.

4. Shep is an old dog. Tricks is young. Shep is 10 yr. old. Tricks is 3 yr. old. How much older is Shep?



BUILDING A DOGHOUSE

Phil and Don have a box to make into a doghouse. The drawing at the right shows its size.



1. Estimate how many sacks it will take to cover the sides and ends. The sacks are 2 ft. long and 1 ft. wide.

2. The boys have a board which is 6 inches wide. They want to use it to make one end. How long must the board be for this?

3. Don thinks it would be better to hang a curtain at the other end instead of using a wooden door. Why do you think he wants a curtain door?

4. How big should an oilcloth be to cover the top?

5. If the oilcloth on top is 1 yd. wide and $3\frac{1}{2}$ ft. long, how far will it hang down all around the top?

BE SURE! BE SHARP!

Copy and subtract:

1. 591 − 124	**2.** 509 − 167	**3.** 284 − 48	**4.** 439 − 370	**5.** 681 − 637	**6.** 457 − 268
7. 275 − 96	**8.** 163 − 79	**9.** 362 − 294	**10.** 434 − 239	**11.** 263 − 185	**12.** 783 − 694

MAKING PROBLEMS

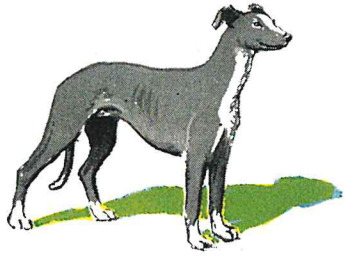
There are many kinds of dogs. Some dogs are good hunters. Some are good workers. Some are kept just for fun. Dogs with short legs, like Doxie, are good hunters in thick brush.

Musher is strong. He pulls sleds across the snow and ice.

Why do you think the greyhound's owner calls her dog "Fleet"? Find the word in your dictionary.

Doxie
Height 9 in.
Weight 18 lb.

Musher
Height 22 in.
Weight 60 lb.



Fleet
Height 18 in.
Weight 25 lb.

1. Make a problem about how much heavier one dog is than another.

2. Make a problem about the height of two dogs.

3. Can you make a problem about how much faster one dog can run than another?

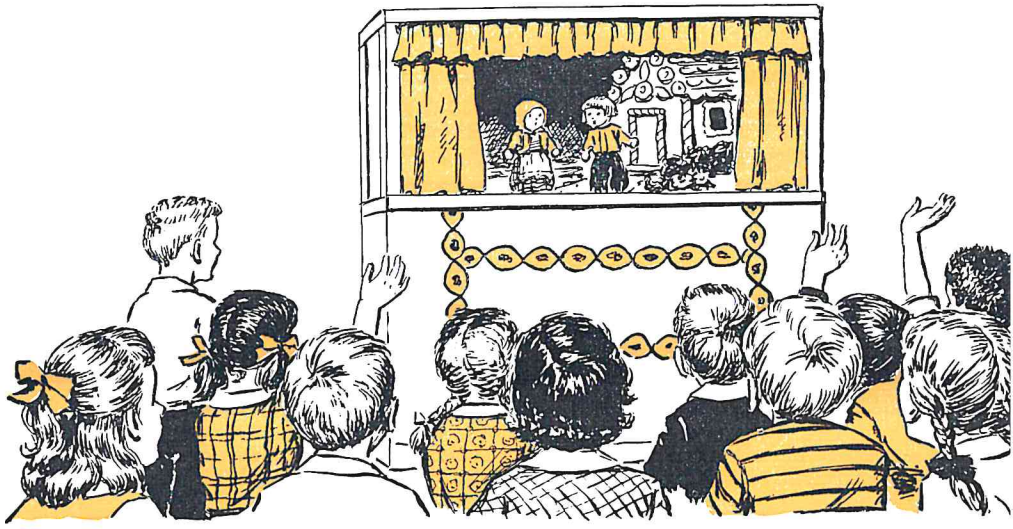
4. Make a problem about how much it costs to feed dogs.

5. Make a problem about the ages of two dogs.

6. Make problems about other pets.

ANSWER STRIP PRACTICE

Use Set 4, page 143.



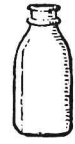
TELL WHAT TO DO

The mothers are coming to the puppet show this afternoon. Punch and cookies will be served after the show. Make a list of all the things the children need to think about that have numbers in them.

The number of children and their mothers will be about 64. How much punch will be needed if each has a half-pint cup? Use the questions below to help find the answer:

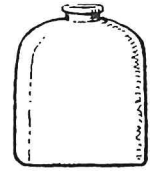
1. How many half-pint cups make a pint?
2. How many pints make a quart?
3. How many quarts make a gallon?
4. 32 pints are how many quarts?
5. 16 quarts are how many gallons?

Let's check by working the other way:



6. 4 gallons are _?_ quarts.
7. 16 quarts are _?_ pints.
8. 32 pints are _?_ cups.

Do all cups hold the same amount as a measuring cup?



PROBLEMS WITHOUT NUMBERS

Read a problem. Then tell how to get the answer.

1. You know how many picture books each child has. How many do the children have all together?

2. You know how many children Jane invited. You know how many Barbara invited. How many did both invite to the party?

3. You know how far you planned to go. You know how far you have gone. How much farther do you still need to go?

4. You know how many papers George carries each day. How many will he carry in a week?

5. You know how many children are coming to the party. You know how many ice-cream sandwiches are in a package. How many packages are needed?

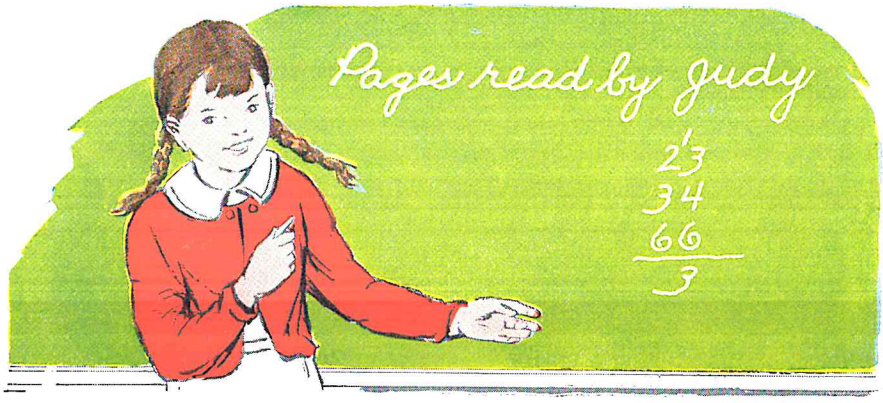
6. You know how many pencils you are buying. You know the cost of each one. How do you find the cost of all of them together?

7. You know how much each of two doll dresses will cost. How do you find how much more one will cost than the other?

PRACTICE

Copy these numbers in columns and add:

1. 33 + 53 + 6 + 23
2. 5 + 43 + 2 + 20
3. 9 + 19 + 938 + 4
4. 66 + 32 + 3 + 105
5. 60 + 6 + 45 + 9
6. 27 + 9 + 88 + 879
7. 858 + 6 + 475 + 877
8. 79 + 735 + 6 + 400
9. 468 + 57 + 966 + 84
10. 5 + 48 + 669 + 978
11. 76 + 268 + 79 + 805
12. 457 + 9 + 683 + 97



MAKING ADDITION PROBLEMS

• When you add, you put two or more groups together. Ask problems about these kinds of groups:

1. How many children there are in two rooms. Be sure to give enough facts.

2. How many dolls both girls have.

3. How much three things would cost together.

4. How much two things cost together.

5. How many pages Judy read in all three days.

6. How many stars were made for the Christmas tree.

PRACTICE

Copy and answer. Be sure to write each number in its place.

Set 1. Addition

1. 64 + 436 + 85	**4.** 340 + 34 + 3	**7.** 29 + 378 + 52
2. 102 + 39 + 436	**5.** 98 + 16 + 234	**8.** 706 + 53 + 87
3. 57 + 7 + 638	**6.** 37 + 4 + 406	**9.** 6 + 73 + 268

Set 2. Subtraction

1. 987 − 364	**4.** 163 − 87	**7.** 985 − 396
2. 456 − 278	**5.** 437 − 79	**8.** 140 − 48
3. 563 − 79	**6.** 250 − 165	**9.** 210 − 137

MAKING SUBTRACTION PROBLEMS

Make up problems about these groups or amounts:

Remainder

1. How many tickets were sold.

2. How many pages are left to read.

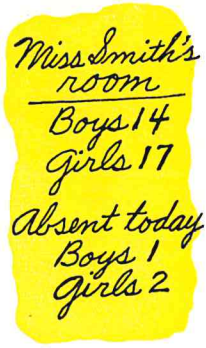
3. How many cents are left after Dale buys a toy.

Building Up

4. How much more money is needed to buy a toy.

5. How much Tom must save to have a dollar.

Comparing



6. How much taller Dot is than Jack.

7. How much heavier Paul is than Tony.

Parts of Groups

8. How many children are here today, if you know the number that are absent.

9. How many more boxes of cookies to sell, if you know the number sold.

THE ANSWER STRIP

More questions for quick answers. After you study these, your teacher will mix them up and read them:

MULTIPLICATION		DIVISION	
4 sixes are ?	8 sixes = ?	3's in 24 ?	6's in 36 ?
9 fours are ?	3 sevens = ?	6's in 18 ?	9's in 27 ?
8 threes are ?	7 sixes = ?	4's in 32 ?	7's in 28 ?
7 fives are ?	8 fours = ?	5's in 15 ?	8's in 32 ?
6 fours are ?	9 sixes = ?	8's in 48 ?	7's in 42?

THINKING WITH FRACTIONS

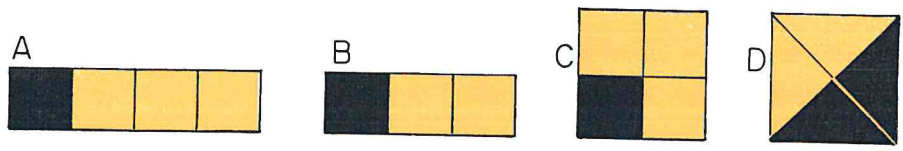
1. Some boys have caught 27 fish. John's share is $\frac{1}{3}$ of them. How many should he get?

2. One foot is what part of a yard?

3. Is $\frac{1}{2}$ of an orange larger or smaller than $\frac{1}{4}$ of that orange?

4. How much is $\frac{1}{3}$ of 30?

5. Name the part that is black in each of these:



Multiply these examples. Think all the answers first. Then write them on folded paper.

	a	b	c	d	e
6.	$6 \times 8 =$	$5 \times 7 =$	$6 \times 4 =$	$7 \times 5 =$	$8 \times 6 =$
7.	$4 \times 7 =$	$8 \times 3 =$	$5 \times 9 =$	$9 \times 6 =$	$7 \times 4 =$
8.	$9 \times 5 =$	$6 \times 9 =$	$6 \times 5 =$	$5 \times 6 =$	$6 \times 6 =$
9.	$7 \times 3 =$	$4 \times 8 =$	$7 \times 6 =$	$9 \times 3 =$	$5 \times 8 =$
10.	$8 \times 4 =$	$9 \times 4 =$	$8 \times 5 =$	$6 \times 7 =$	$4 \times 9 =$

Use folded paper to finish these:

	a	b	c	d
11.	$\frac{1}{3}$ of 6 =	$\frac{1}{4}$ of 12 =	$\frac{1}{6}$ of 24 =	$\frac{1}{5}$ of 20 =
12.	$\frac{1}{2}$ of 8 =	$\frac{1}{3}$ of 12 =	$\frac{1}{8}$ of 24 =	$\frac{1}{4}$ of 16 =
13.	$\frac{1}{8}$ of 16 =	$\frac{1}{2}$ of 12 =	$\frac{1}{6}$ of 12 =	$\frac{1}{2}$ of 16 =
14.	$\frac{1}{4}$ of 4 =	$\frac{1}{4}$ of 8 =	$\frac{1}{2}$ of 18 =	$\frac{1}{4}$ of 32 =

15. Watch the signs:

a. $6\overline{)540}$ **b.** $7\overline{)427}$ **c.** $\begin{array}{r} 69 \\ \times 4 \\ \hline \end{array}$ **d.** $\begin{array}{r} 56 \\ \times 8 \\ \hline \end{array}$

ESTIMATING WITH FRACTIONS

Draw pictures if they will help you.

Mr. Hunt has a station wagon. Each winter he takes boys and girls to play in the snow. Five boys and girls plan the trip and will share the cost.

1. Will $\frac{1}{5}$ of \$1.00 be about 20¢, 25¢, or 30¢?

2. The snow slide is 29 miles away. Will "Halfway House" be about 10 mi., 15 mi., or 20 mi. out?

3. If the trip one way is 29 mi., will the whole trip be nearer 15 mi., 30 mi., 50 mi., or 60 mi.?

4. The group will leave home at 9:00 A.M. and return at 3:30 P.M. Will half of their time be gone at 1:00 P.M.?

5. Mr. Hunt says actual coasting time will be about $3\frac{1}{2}$ hours. If two children share 1 sled, the same amount of time, will each have it 2 hours?

6. Mrs. Hunt is sending 2 quarts of hot cocoa. Will each child's share be a pint, or more, or less?

7. Mrs. Hunt is sending two big candy bars. If Mr. Hunt and 5 children share them equally, will each one get $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{5}$, or $\frac{1}{6}$ of a bar?

8. Mrs. Hunt is also sending a dozen sandwiches. Will $\frac{1}{6}$ of them be 2 apiece, or more, or less?

1. How many boys came to play at Phil's house Saturday? He asked 6 boys to play at his house, but 2 did not come.

2. How many dolls did all three girls bring? Jean brought 8 dolls, Marian brought 6, and Dot brought 5.

3. How many more cupcakes will Peggy need? "We have six now," said Mrs. White. "You will need 3 times that many more."

4. Fred gave away 30 English walnuts. He counted 27 which he had left. How many did he have before he gave 30 away?

5. The children take turns making a map. Eight work at a time. How many may have a turn in 3 times?

6. The boys and girls in Miss Ames' room have these pets: 14 dogs, 8 cats, 1 parrot, 3 canaries, 8 pigeons, 1 turtle, 3 white mice, and 2 guinea pigs. How many of their pets are birds?

7. The class will need 64 sheets of colored paper for pasting pictures. Their teacher now has 41 sheets. How many sheets does she still need to get?

8. What number of box tops is Bob's share? He is to have one third of 24 box tops.

9. How much change should Ann get back? She gives the clerk 3 dimes to pay for a 23-cent comb.

10. How much will 5 books cost at 69¢ each?

PRACTICE

Set 1. Addition

1. 227 543	**2.** 238 868	**3.** 64 376	**4.** 154 369	**5.** 565 248	**6.** 158 754
7. 754 335 6	**8.** 38 970 6	**9.** 6 309 62	**10.** 80 7 456	**11.** 308 575 95	**12.** 277 38 663
13. \$1.76 0.78 2.39	**14.** \$ .48 2.77 1.76	**15.** \$0.37 2.69 1.12	**16.** \$ .75 .89 .58		

Set 2. Subtraction

1. 791 753	**2.** 543 509	**3.** 854 780	**4.** 805 636
5. 456 396	**6.** 103 38	**7.** 607 499	**8.** 653 564
9. 447 358	**10.** 175 97	**11.** 104 75	**12.** 113 46

Set 3. Mixed Practice

Copy and find the answers:

1. $273 + 59 + 6$	**6.** $350 \div 5$	**11.** 5×89
2. $107 - 24$	**7.** $85 + 7 + 344$	**12.** $208 \div 4$
3. $3\overline{)120}$	**8.** $2 \times \$1.25$	**13.** $135 - 79$
4. $3 \times 75¢$	**9.** $216 - 67$	**14.** $4 \times \$.45$
5. $64 \div 2$	**10.** $3\overline{)159}$	**15.** $4\overline{)248}$

SEVENS, EIGHTS, AND NINES

A TABLE OF MULTIPLICATION FACTS THAT WE KNOW

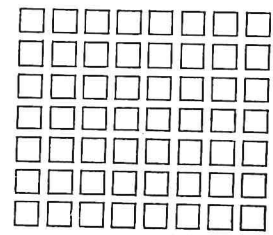
The number where a row and a column cross is a product. Find the products of 4×6, 7×5, and 3×4.

	0	1	2	3	4	5	6	7	8	9	10
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	?	?	?	70
8	0	8	16	24	32	40	48	?	?	?	80
9	0	9	18	27	36	45	54	?	?	?	90
10	0	10	20	30	40	50	60	70	80	90	100

You have studied all but 9 of the multiplication facts. Their products should be where the question marks are. There are several ways to find out what numbers belong in these places:

A. You could add 7 more each time in the column of sevens. You could add 8 more each time in the eights' column. You could add 9 more each time in the nines' column.

B. You could lay out counters and count them. The picture shows how to find the product of 7×8.



C. You could also write **8** seven times in a column and add to find 7×8.

Page 157 will help find the facts.

DISCOVERING THE PRODUCTS

Figure out these products by adding:

1. You know 6 sevens are 42.

How many are 7 sevens? → $42 + 7 = ?$

How many are 8 sevens? → → $49 + 7 = ?$

How many are 9 sevens? → → → $56 + 7 = ?$

2. On a sheet of paper make a table for the blank spaces shown on page 156. Make the table like the one at the right.

Figure out the products and write them in your table.

	6	7	8	9	10
6	36	42	48	54	60
7	42				70
8	48				80
9	54				90
10	60	70	80	90	100

3. You know 6 eights are 48.

How many are 7 eights? → $48 + 8 = ?$

How many are 8 eights? → → $56 + 8 = ?$

How many are 9 eights? → → → $64 + 8 = ?$

4. You know 6 nines are 54.

How many are 7 nines? → $54 + 9 = ?$

How many are 8 nines? → → $63 + 9 = ?$

How many are 9 nines? → → → $72 + 9 = ?$

REMEMBERING THE NINES

Tommy has an easy way to remember the nines. He says to look at the column under 9 and the column under 10 below.

1 nine is 1 less than 1 ten, so it is 9 ones.
2 nines are less than 2 tens, so 2 nines are in the teens.
3 nines are less than 3 tens, so 3 nines are in the twenties.
4 nines are less than 4 tens, so 4 nines are in the thirties.
5 nines are less than 5 tens, so 5 nines are in the forties.
6 nines are less than 6 tens, so 6 nines are in the fifties.
7 nines are less than 7 tens, so 7 nines are in the sixties.
8 nines are less than 8 tens, so 8 nines are in the seventies.
9 nines are less than 9 tens, so 9 nines are in the eighties.

Use this guide to help you:

4 nines are in the thirties.
6 nines are in the fifties.
3 nines are in the _?_.
5 nines are in the _?_.
7 nines are in the _?_.
9 nines are in the _?_.
6 nines are in the _?_.
8 nines are in the _?_.
9 nines are in the _?_.
7 nines are in the _?_.
4 nines are in the _?_, so 9 fours are in the thirties.
3 nines are in the _?_, so 9 threes are in the _?_.
8 nines are in the _?_, so 9 eights are in the _?_.

	9	10
1	9	10
2	18	20
3	27	30
4	36	40
5	45	50
6	54	60
7	63	70
8	72	80
9	81	90

Practice by saying the 9 both as a multiplier and as a multiplicand; that is, 9 fives, and 5 nines.

You know how many nines are in 54. How can you tell quickly how many threes are in 54?

MORE ABOUT THE NINES

"But that isn't all," said Tommy. "Look at this. You add across and the answer is always nine." Tommy thinks "7 nines are in the sixties. 6 and 3 are 9. 63."

8 nines are in the seventies. 7 and _?_ are 9. 72.

9 nines are 81	8 and 1 are 9
8 nines are 72	7 and 2 are 9
7 nines are 63	6 and 3 are 9
6 nines are 54	5 and 4 are 9
5 nines are 45	4 and 5 are 9
4 nines are 36	3 and 6 are 9
3 nines are 27	2 and 7 are 9
2 nines are 18	1 and 8 are 9
1 nine is 9	9 is 9

FIRST PRACTICE

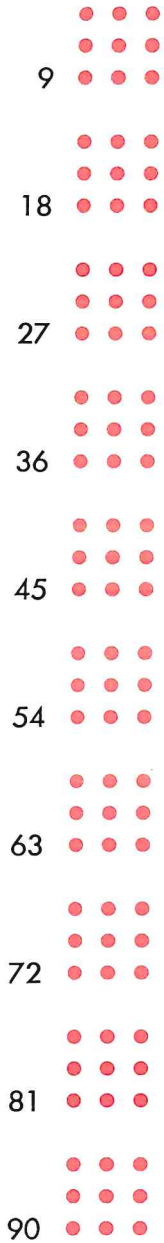
5 nines are in the forties. 4 and _?_. 45
3 nines are in the twenties. 2 and _?_.
6 nines are in the fifties. (Say the rest.)
8 nines are in the _?_.
Your teacher will give you many more if there is time.

SECOND PRACTICE (*for tomorrow*)

How many are 6 nines? How did you find out?
How many are 4 nines?
Practice the nines until you know them well.

QUICK PRACTICE

2 nines are _?_	7 nines are _?_	6 nines are _?_
5 nines are _?_	4 nines are _?_	9 nines are _?_
8 nines are _?_	3 nines are _?_	9 threes are _?_
9 twos are _?_	9 sixes are _?_	9 fives are _?_
9 fours are _?_	9 eights are _?_	9 sevens are _?_



DIVIDING BY NINE

How many 9's are there in 18? in 27?

How many 9's are there in 90? in 54?

If you have trouble remembering the nines, count the groups of dots.

7 nines are ? . 4 nines are ? . 5 nines are ? .

1. Say the answers for these multiplications to yourself:

4	9	8	9	7	3	9	6
×9	×6	×9	×5	×9	×9	×9	×9

2. Say the answers for these divisions:

a. $9\overline{)36}$ $9\overline{)81}$ $9\overline{)45}$ $9\overline{)27}$ $9\overline{)72}$ $9\overline{)54}$ $9\overline{)63}$

b. $5\overline{)45}$ $8\overline{)72}$ $4\overline{)24}$ $3\overline{)27}$ $6\overline{)42}$ $6\overline{)54}$ $4\overline{)36}$

c. $2\overline{)18}$ $6\overline{)48}$ $8\overline{)32}$ $7\overline{)63}$ $8\overline{)24}$ $9\overline{)81}$ $7\overline{)28}$

3. Write the products on folded paper:

a.	9	4	2	6	4	9	7
	3	8	9	6	9	8	5
b.	8	5	6	9	7	3	9
	6	9	3	7	4	7	6

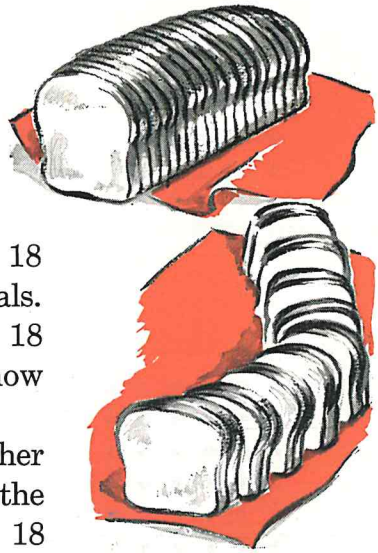
4. Write the quotients on folded paper:

a. $9\overline{)36}$ $4\overline{)24}$ $3\overline{)24}$ $6\overline{)30}$ $9\overline{)81}$ $4\overline{)32}$ $7\overline{)63}$

b. $9\overline{)45}$ $7\overline{)28}$ $6\overline{)54}$ $3\overline{)21}$ $8\overline{)72}$ $9\overline{)27}$ $6\overline{)36}$

5. Write all you know about 9. See page 99.

PARTS OF A NUMBER



1. What is $\frac{1}{6}$ of 6? of 12? of 18?

2. What is $\frac{1}{9}$ of 18? of 27? of 45?

3. What is $\frac{1}{5}$ of 10? of 25? of 45?

4. The loaf of bread is cut into 18 slices. Mother wants it to last for 2 meals. Where would she divide the 18 slices? 18 separated into 2 parts would have how many in each part? $\frac{1}{2}$ of 18 is _?_.

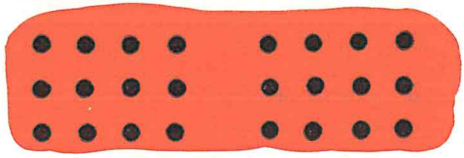
5. How many sandwiches can Mother make from the whole loaf? Measure the loaf by 2 slices for each sandwich. 18 measured by 2's is _?_.

6. Lay out 24 counters on your desk. Each time after you take some away, put them back.

Take away $\frac{1}{2}$ of them.

Take away $\frac{1}{4}$ of them.

Take away $\frac{1}{3}$; $\frac{1}{6}$; $\frac{1}{8}$.



7. Twenty-four can be divided evenly in many ways. At the right is a list of ways to part 24.

Is $\frac{1}{2}$ of 24 more than $\frac{1}{4}$ of 24?

Is $\frac{1}{4}$ more than $\frac{1}{6}$?

Which is more, $\frac{1}{8}$ or $\frac{1}{2}$? $\frac{1}{4}$ or $\frac{1}{3}$?

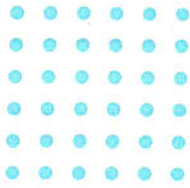
24	
$\frac{1}{2}$	= 12
$\frac{1}{3}$	= 8
$\frac{1}{4}$	= 6
$\frac{1}{6}$	= 4
$\frac{1}{8}$	= 3

8. As you divide 24 into more parts, what happens to the size of the parts?

9. Cut circles into fourths, thirds, halves, and sixths. Write the size on each part, this way: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$. Compare the parts for size.

10. As you divide a circle into a larger number of equal parts, what happens to the size of the parts?

A

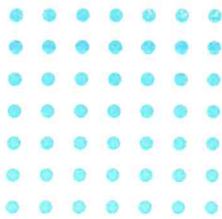


6 sixes = ?

B

7 sixes = ?

C



7 sevens = 49

D

6 sevens = 42

6 SEVENS, 7 SIXES, 7 SEVENS

1. How many sixes are there in group *A*?

2. How many sixes are there in group *B*?

3. How many are 6 sixes? 7 sixes?

6 sixes are 36. 7 sixes are 36 plus 6 more.

$6 \times 6 = 36$ $36 + 6 = 42$ $7 \times 6 =$?

4. How many sevens are in group *B*?

5. How is group *D* different from group *C*?

6. How many are 7 sevens? 6 sevens?

7 sevens are 49. 6 sevens are 7 less than 49.

$7 \times 7 = 49$ $49 - 7 = 42$ $6 \times 7 =$?

7. Count the 7's in group *B*. $42 \div 7 = 6$

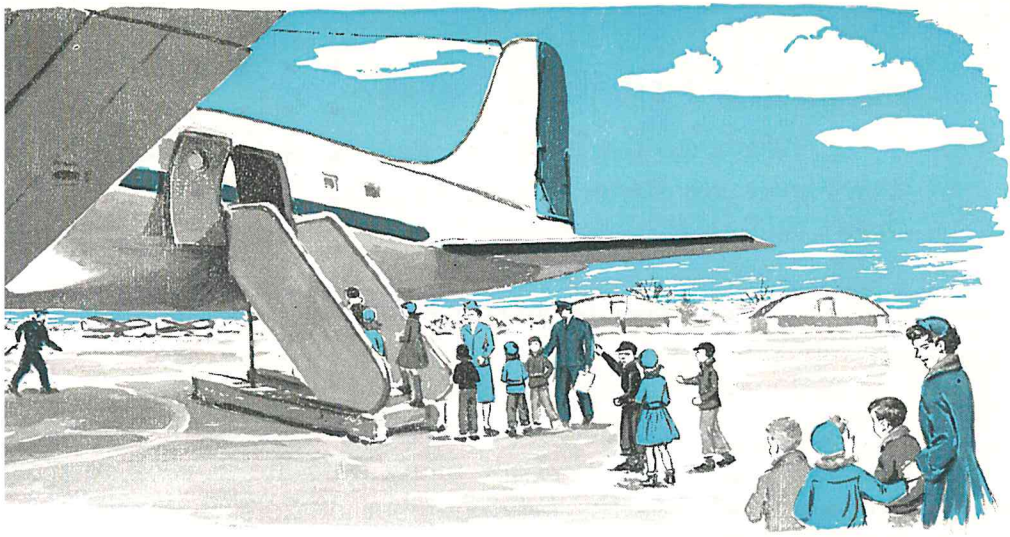
Count the 6's in group *B*. $42 \div 6 = 7$

Multiply these. Use folded paper.

8.	9	2	7	9	7	5	7
	4	9	4	6	3	9	6
9.	4	9	5	6	3	7	8
	6	3	6	7	8	6	9
10.	7	7	4	9	6	9	5
	7	9	7	9	9	5	7

Divide these. Use folded paper.

11.	$4\overline{)36}$	$7\overline{)42}$	$3\overline{)21}$	$9\overline{)45}$	$6\overline{)42}$
12.	$7\overline{)49}$	$6\overline{)42}$	$9\overline{)63}$	$6\overline{)54}$	$7\overline{)42}$
13.	$7\overline{)35}$	$9\overline{)81}$	$7\overline{)49}$	$8\overline{)72}$	$7\overline{)28}$



MAKING SMALLER GROUPS FROM LARGER GROUPS

1. Thirty children in Mrs. Smith's class are planning to visit the airport. How many cars will be needed to take them if each car can take 5 children?

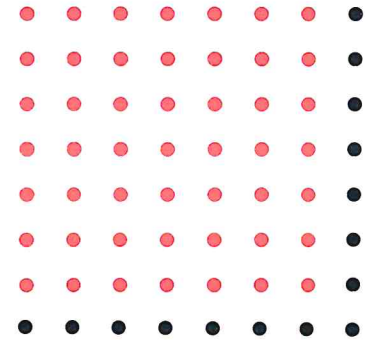
2. The guide at the airport tells the 30 children to divide into groups of 3 each. How many groups will there be?

3. The small plane in the picture carries 27 passengers. There are 3 equal rows of seats, 2 on one side of the aisle and 1 on the other. How many seats are in each row?

GROWTH TEST

1. $827 + 559$
2. $324 \div 4$
3. $738 - 209$
4. 4×73
5. $300 \div 5$
6. $193 - 36$
7. $3 + 8 + 5 + 4$
8. $540 \div 9$
9. 7×413
10. $83 + 9 + 959$
11. 5×901
12. $28 + 208 + 9 + 95$
13. $349 - 267$
14. $677 + 66 + 967$
15. $470 - 72$
16. 8×46
17. 6×97
18. $\frac{1}{8}$ of 24
19. $509 - 473$
20. $357 \div 7$

8 SEVENS, 7 EIGHTS, 8 EIGHTS



1. Count the red dots each way. How many are there all together? Does $7 \times 7 = 49$?

2. How many dots are there each way if you count both the red dots and the black dots? Does $8 \times 8 = 64$?

3. Lay a piece of paper over the bottom row of black dots. How many rows can you see now? How many dots are in each row? How can you find the total number of dots that can be seen? How many eights can you see?

4. Now move the paper over the right-hand column of black dots. How many sevens can you see? How many dots do you see?

$7 \times 7 = 49 \rightarrow 49 + 7 = 56 \rightarrow$ so $8 \times 7 =$?

$8 \times 8 = 64 \rightarrow 64 - 8 = 56 \rightarrow$ so $7 \times 8 =$?

Multiply these. Use folded paper.

	a	b	c	d	e	f	g	h	i
5.	4	9	3	7	4	5	7	8	5
	5	9	6	8	3	6	3	8	4
6.	3	8	4	3	6	7	5	6	6
	7	7	4	9	5	8	7	3	6

Divide these. Use folded paper.

	a	b	c	d	e	f	g
7.	$2\overline{)10}$	$3\overline{)21}$	$4\overline{)20}$	$7\overline{)56}$	$9\overline{)81}$	$5\overline{)25}$	$8\overline{)56}$
8.	$3\overline{)15}$	$7\overline{)49}$	$4\overline{)12}$	$5\overline{)30}$	$8\overline{)64}$	$3\overline{)18}$	$8\overline{)72}$
9.	$8\overline{)56}$	$4\overline{)24}$	$3\overline{)27}$	$7\overline{)35}$	$4\overline{)32}$	$7\overline{)56}$	$3\overline{)24}$

THE NUMBER OF GROUPS TIMES THE NUMBER IN A GROUP

1. There are 28 children in one room, 32 in one, and 29 in another. How will you find out how many there are all together? Why can't you multiply?

2. There are 12 pencils in a package. There are 3 packages. How many pencils are there in all? Can you find out by addition? by multiplication? Which is shorter?

3. Our class will use about 31 sheets of paper daily for 5 days. How many sheets will be needed? Is it quicker to add or to multiply to find the answer? Why?

4. Chalk comes in boxes of 12 dozen pieces. There are 144 pieces in each box. Our room has used 2 boxes this year. How many pieces are in 2 boxes?

5. Each of the 28 children in our room uses about 4 pencils in a year. How many pencils is that all together? Do you add or multiply? Why?

6. A coin wrapper holds 50 one-cent pieces. How many cents are in 8 wrappers? Label the answer.

7. It is 75 yards across the playground. How many feet is 75 yards?

$$\begin{array}{r} 75 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ \times\ 75 \\ \hline \end{array}$$

Does it matter which is the multiplicand?

8. The cafeteria orders 24 gallons of milk a day. How many pints is that?

9. Count the weeks of school that are left.

Multiply to find about how many school days are left.

10. Rickey has 3 dimes, 5 nickels, and 4 cents. How many cents does Rickey's money equal? Do you add, or multiply, or do both to find out?

11. You know how many equal groups there are. You know the number in one group. How do you find out how many there are in all the groups?

12. Write all you know about 7. See page 99.

8 SIXES AND 6 EIGHTS

1. How could you find out how many 8 sixes are? If you know how many 8 sixes are, how could you find 6 eights?

2. These are ways that some boys and girls have used to discover 8×6 and 6×8.

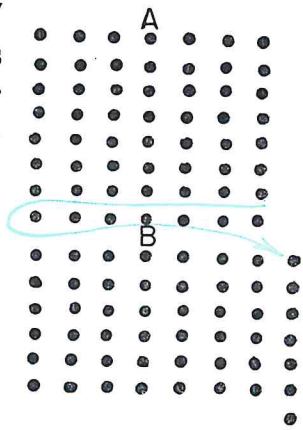
6
6
6 8 ← Joe added:
6 8 Betty knew 4 sixes = 24, so she thought: → 24 / 24
6 8 Jean knew that 7 sixes are 42, so she added
6 8 6 more.
6 8 Harold knew that 7 eights are 56, so he subtracted
6 8 8 from 56.

PRACTICE

Multiply. Use folded paper.

	a	b	c	d	e	f	g	h	i	j
3.	6	8	4	7	9	4	8	6	7	8
	9	7	9	8	6	8	9	8	9	5
4.	6	8	7	6	9	5	9	5	4	7
	7	9	6	8	5	7	4	8	6	9
5.	8	9	8	7	9	8	5	7	9	8
	8	7	6	4	9	3	9	7	8	4

Bill says you can see that 7×7 is 49. So 6×8 will be one less. It's the same for 8×8 and 7×9; for 5×5 and 4×6; and so on. He says to move one row to make another column and you will have an extra dot left over. Try this with 3×3 and 2×4; with 4×4 and 3×5.



HOW MANY TIMES AS BIG?

1. Estimate how many inches long line *A* is. Line *A* is about how many times as long as line *B*?

A

B

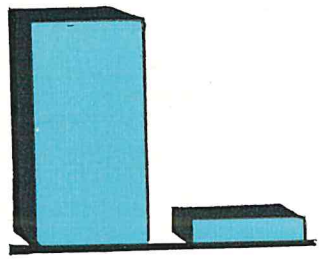
Check by using a ruler and counting the spaces.

2. A 25-pound sack of sugar is how many times as big as a 5-pound sack?

3. How many ounces are there in 8 lb. of sugar?

4. How many inches tall is 6 ft.?

5. Estimate the size of the small box compared with the big one.



6. Which box is heavier? Can you tell without lifting them? Why?

7. A tall building is 24 stories high. Another building has only 6 stories. About how many times as high is the tall building?

8. A gallon of milk is how many times as much as a quart of milk?

9. A yard is how many times as long as a foot?

10. A foot is how many times as long as an inch?

11. A pound of butter is how many times as heavy as $\frac{1}{4}$ pound of butter?

12. A quarter is worth how many times as much as a nickel?

13. A dollar is worth how many times as much as a quarter?

14. A dollar bill is worth how many times as much as a dime?

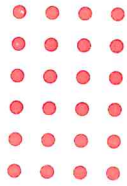
15. Write all you know about 8. See page 99.

MULTIPLIERS AND MULTIPLICANDS

multiplicand → 12
multiplier → 4
product → 48

multiplicand

multiplier



$$\begin{array}{r} 4 \\ \times 6 \\ \hline 6 \\ \times 4 \end{array}$$

1. How many dots are there all together?
6 fours are how many?
$6 \times 4 =$?
You can look at the dots another way, too.
4 sixes are ?
$4 \times 6 =$?

> If the order of the multiplicand and the multiplier is changed, the product remains the same.

2. Bob's dad buys 12 stamps at 4¢ each. Is the total cost 12×4?

Which multiplication is easier?
Is the answer the same either way?

$$\begin{array}{r} 4 \\ \times 12 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ \times 4 \\ \hline \end{array}$$

Do you remember how to check addition? Do you change directions, add down, then up?

You check multiplication by changing the places of the multiplicand and multiplier.

3. Answer these questions:

a. If $8 \times 9 = 72$, then $9 \times 8 =$?.
b. If $7 \times 8 = 56$, then $8 \times 7 =$?.
c. If $9 \times 6 = 54$, then $6 \times 9 =$?.
d. If $6 \times 8 = 48$, then $8 \times 6 =$?.
e. If $7 \times 9 = 63$, then $9 \times 7 =$?.

4. Multiply these the easy way: **a.** 16 fours **b.** 12 eights **c.** 75 sixes **d.** 120 fives **e.** 144 twos

PRACTICE

Set 1. Addition

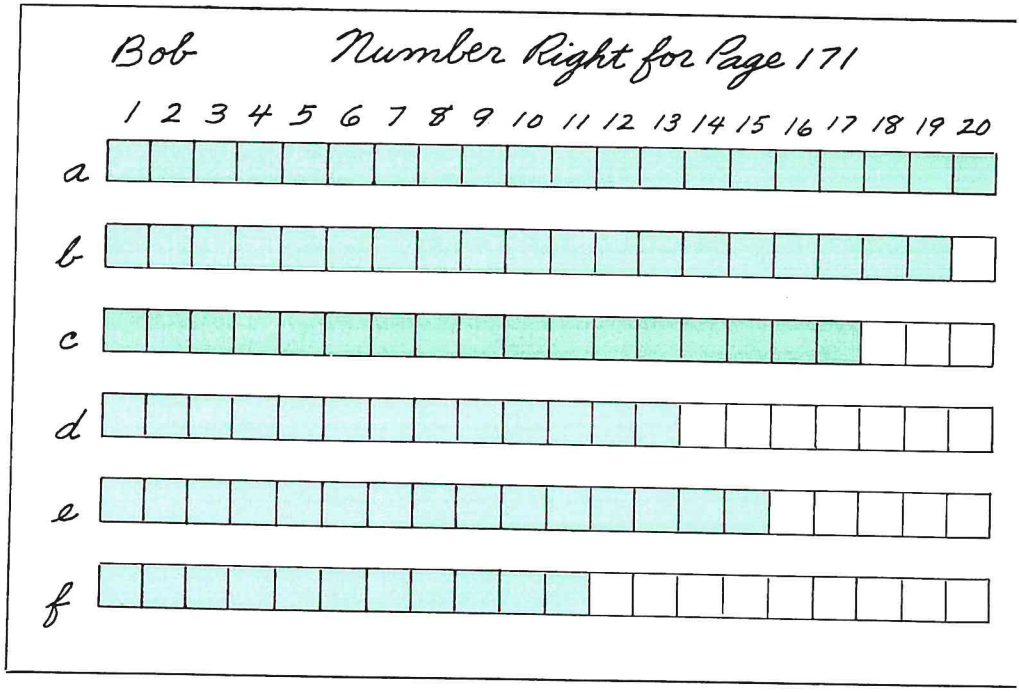
	a	b	c	d	e	f	g	h
1.	648	922	475	947	493	482	528	312
	121	139	324	257	292	324	548	358
2.	539	409	476	827	457	859	868	858
	285	604	847	356	985	758	646	345
3.	57	45	59	58	85	68	69	47
	89	78	67	57	87	69	56	98
	73	97	86	69	37	99	66	57

Set 2. Subtraction

1.	78	131	84	151	983	142	84	91
	69	97	35	78	646	57	58	54
2.	143	937	836	835	771	825	763	927
	87	648	367	289	293	457	269	529
3.	464	763	945	925	934	973	953	736
	139	485	246	698	256	384	398	439

Set 3. Multiplication and Division

1.	92	19	97	85	26	59	58	35
	4	6	3	5	9	8	7	6
2.	38	72	94	49	27	48	75	83
	3	4	7	5	6	8	9	7
3.	26	56	41	48	37	76	68	38
	8	5	9	6	8	7	4	9
4.	$4\overline{)328}$	$9\overline{)639}$	$7\overline{)560}$	$4\overline{)288}$	$5\overline{)350}$	$9\overline{)729}$	$7\overline{)497}$	$8\overline{)640}$



This is Bob's record of his scores for page 171. Bob colored a square for every example right. The row after *a* is for the (**a**) column on the next page; *b* is for the (**b**) column; *c* is for the (**c**) column; and so on.

1. For which group did Bob make a perfect score?
2. For which group did he miss 3?
3. How many did Bob miss in Column (**e**)?
4. He had the least number right in which group?
5. Is Bob better in division or multiplication?
6. Does Bob need more study?

A chart is a picture of something. The chart shown above is called a graph. A graph is a picture of numbers. It makes numbers of things easy to understand.

Chart your record for page 171. Use paper with $\frac{1}{4}$ inch squares. If you haven't any, use ruled paper and draw 21 lines up and down to make squares.

QUESTIONS FOR THE ANSWER STRIP

Use one column at a time.

a	b	c	d	e	f
(1)					
1 × 8	6 × 2	6 × 4	3 × 8	24 ÷ 6	24 ÷ 4
9 × 1	9 × 2	4 × 5	8 × 9	21 ÷ 3	56 ÷ 8
6 × 1	2 × 3	9 × 3	8 × 5	20 ÷ 4	24 ÷ 8
1 × 3	1 × 1	5 × 7	9 × 7	27 ÷ 9	27 ÷ 3
5 × 1	3 × 5	9 × 8	6 × 8	35 ÷ 5	54 ÷ 9
(6)					
2 × 6	3 × 3	4 × 3	3 × 9	12 ÷ 4	40 ÷ 8
4 × 1	2 × 4	8 × 4	9 × 6	72 ÷ 9	63 ÷ 9
5 × 0	2 × 9	3 × 6	6 × 7	32 ÷ 8	28 ÷ 4
1 × 5	8 × 2	4 × 4	8 × 8	16 ÷ 4	64 ÷ 8
8 × 1	7 × 2	7 × 8	4 × 6	24 ÷ 8	45 ÷ 5
(11)					
7 × 1	5 × 2	8 × 3	7 × 6	18 ÷ 3	36 ÷ 4
2 × 5	7 × 3	9 × 5	5 × 9	72 ÷ 8	35 ÷ 7
1 × 4	5 × 4	6 × 6	7 × 9	45 ÷ 9	49 ÷ 7
1 × 6	9 × 9	7 × 4	4 × 6	36 ÷ 6	42 ÷ 6
3 × 1	5 × 5	6 × 8	7 × 5	28 ÷ 7	63 ÷ 7
(16)					
1 × 2	5 × 3	4 × 6	7 × 7	48 ÷ 6	32 ÷ 4
2 × 2	3 × 4	8 × 7	4 × 9	24 ÷ 3	48 ÷ 8
2 × 8	6 × 5	9 × 6	8 × 6	40 ÷ 5	42 ÷ 7
3 × 2	3 × 7	8 × 6	7 × 8	36 ÷ 9	56 ÷ 7
2 × 7	6 × 3	6 × 7	6 × 9	30 ÷ 5	54 ÷ 6

Keep a list of the facts you do not know. Use meaning and practice cards to study, if you need them.

FINDING THE TROUBLE SPOTS

MEANINGS

1. Use 3 different digits to write the largest number you can. Use each digit only once. 28–32

2. Write each number in words: 15 46 210 402

3. Use digits to write eight thousand, fifty-two; forty-one hundred.

4. Which number is smallest? 1001 220 960 97

5. Which has most thousands? 5640 874 962 3478

6. In which number is the 3 in tens' place?
378 873 738 3010

7. Write the name of the fifth day of the week. 33

8. Which is the most money? 60¢ 95¢ $.87 $0.76 84, 85

9. How many cents are there in 3 dimes? in 2 dollars?

10. Which is a quarter dollar? $25 $2.50 25¢ 40¢

11. Fifty cents is how many dimes?

12. How many inches long is each line? Estimate.

a. _____

b. _____

13. Write the fraction for each black part: 74, 75, 82

14. Which is largest? $\frac{1}{5}$ $\frac{1}{10}$ $\frac{1}{3}$ $\frac{1}{4}$

15. A foot is _?_ inches. A yard is _?_ feet. 114

16. A gallon is _?_ quarts. 120

17. A pound is _?_ ounces. 119

ADDITION AND SUBTRACTION

Set 1. Addition

1. 528 348	**2.** 743 269	**3.** 368 573	**4.** 926 354	**5.** 943 948	40, 41
6. 957 534	**7.** 374 976	**8.** 457 926	**9.** 758 954	**10.** 384 367	
11. \$1.34 2.35	**12.** \$3.25 .43	**13.** \$.73 .56	**14.** \$ .92 2.37	**15.** \$3.98 6.24	86
16. 659 78 300	**17.** 370 5 867	**18.** 587 40 908	**19.** 653 586 7	**20.** 367 59 876	26

21. 34 + 4 + 621 **22.** 8 + 10 + 452

23. 29 + 632 + 4 **24.** 87 + 3 + 960

25. 875 + 78 + 409 **26.** 267 + 979 + 798

Set 2. Subtraction

1. 119 83	**2.** 128 35	**3.** 137 62	**4.** 149 57	**5.** 188 93	21, 22
6. 94 64	**7.** 80 20	**8.** 102 32	**9.** 243 40	**10.** 147 3	
11. 151 63	**12.** 145 98	**13.** 163 64	**14.** 157 98	**15.** 146 89	43
16. 868 795	**17.** 712 307	**18.** 941 502	**19.** 126 47	**20.** 930 357	45, 46

21. 125 − 97 **22.** 104 − 8 **23.** 147 − 79

PROBLEM SOLVING

1. How much change should Betty get? She gives 2 half dollars and a quarter to pay for a doll's dress which costs $1.09.

2. What time must Jim start home? It is now 2:00 o'clock and he can play an hour and a half longer.

3. How many children will be in each group for games? The 30 children divide into 3 equal groups.

4. Sandra is looking at a pencil which costs 39¢. The clerk says, "For 30¢ more you can get a pencil that writes two colors." What does it cost?

5. Estimate the cost of 5 books at 98¢ each. Give the answer in dollars.

6. How much money will Dick get when he sells 8 rabbits? He gets a dollar apiece for them.

7. Betty lives 6 blocks straight east of school, and Sally lives 4 blocks straight west of school. How far apart do they live?

8. Ten children were asked to a party. All but three came. How many came to the party?

9. Tom can hop, skip, and jump 5 yards. How many feet is that?

10. You know what something costs. You know how much money you have. You want to know how much more money you will need. Do you add, subtract, multiply, or divide?

11. Write a problem about how much more one thing costs than another thing.

MULTIPLICATION AND DIVISION

Set 1. Multiplication

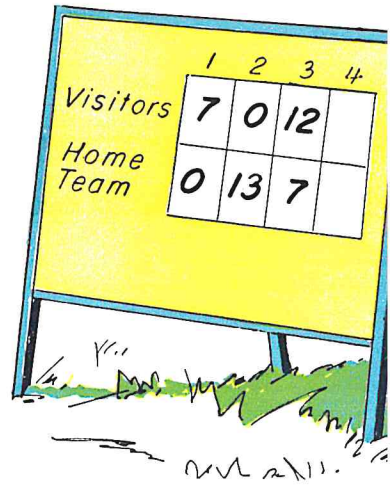
1. 32 × 3	**2.** 64 × 2	**3.** 41 × 5	**4.** 32 × 4	**5.** 53 × 3	56
6. 501 × 5	**7.** 610 × 6	**8.** 923 × 3	**9.** 511 × 6	**10.** 831 × 3	57
11. 42 × 9	**12.** 73 × 8	**13.** 83 × 5	**14.** 69 × 9	**15.** 74 × 6	58 59
16. \$.47 × 7	**17.** \$.64 × 4	**18.** \$.84 × 8	**19.** \$.47 × 5	**20.** \$.75 × 9	88
21. 210 × 7	**22.** 116 × 5	**23.** 601 × 8	**24.** 719 × 4	**25.** 915 × 6	67

26. 6×83 **27.** $3 \times \$.25$ **28.** 7×85

Set 2. Division

1. $2\overline{)60}$	**2.** $4\overline{)80}$	**3.** $3\overline{)180}$	**4.** $5\overline{)250}$	64
5. $6\overline{)240}$	**6.** $9\overline{)360}$	**7.** $8\overline{)400}$	**8.** $7\overline{)210}$	
9. $4\overline{)84}$	**10.** $2\overline{)46}$	**11.** $5\overline{)55}$	**12.** $3\overline{)69}$	66
13. $2\overline{)148}$	**14.** $3\overline{)243}$	**15.** $4\overline{)168}$	**16.** $3\overline{)279}$	
17. $560 \div 8$	**18.** $420 \div 6$	**19.** $540 \div 9$	**20.** $630 \div 7$	64
21. $639 \div 9$	**22.** $287 \div 7$	**23.** $480 \div 8$	**24.** $366 \div 6$	66
25. $\frac{1}{2}$ of 128	**26.** $\frac{1}{4}$ of 204	**27.** $\frac{1}{3}$ of 219	**28.** $\frac{1}{8}$ of 328	77
29. $\frac{1}{5}$ of 355	**30.** $\frac{1}{7}$ of 217	**31.** $\frac{1}{6}$ of 360	**32.** $\frac{1}{9}$ of 180	

UNDERSTANDING ZERO BETTER



ZERO MEANS "NOT ANY"

The fourth quarter of the football game is just starting.

1. Which team is ahead?

2. Which team scored first?

3. Which team made no score in the second quarter?

4. When are two scores close?

5. When are two scores even?

6. How many children were absent on Monday? Tuesday? Wednesday?

Number Absent	
Monday	2
Tuesday	0
Wednesday	0

- Zero is used to write "not any."
- Zero is used to write "none."

7. One time when Paul came home from a game, he said, "The game was a *tie*, nothing to nothing."

What is a tie game? Did either team score? How can a game be a tie when both teams score?

8. If you score zero every time for 4 times, what is your score? $4 \times 0 = \_?\_$

9. How many are $0 + 0$? Tell when you might add 0 to 0.

10. Tell about other times when zero is used to show "not any" or "none."

11. Is 6×0 more than 2×0? Why or why not?

12. Is $4 + 0$ more than $3 + 0$? Why or why not?

Six boys went to the cooky box for cookies. This is what happened: $6 \times 0 = 0$. What does it mean?

ZERO IS A STARTING POINT

1. What is the score of each team at the very beginning of a game?

2. What does a speedometer read before a car starts?

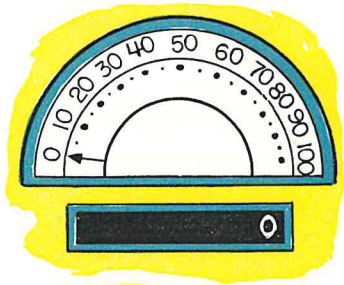
3. What does the odometer on a brand new car read?

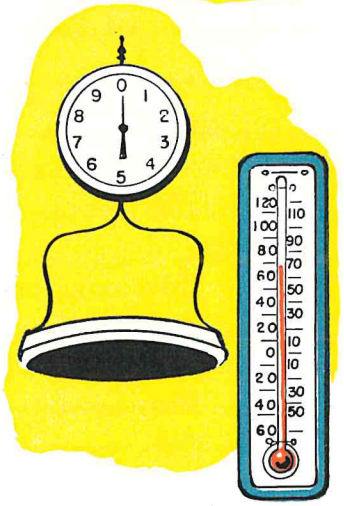
4. What do scales read before you put something on them?

5. Look at a ruler and a yardstick. Where does the first inch begin? Does the place have a number?

6. Have you ever heard someone say, "It's 20 below today?" What does it mean?

Look at the thermometer. Does it measure both ways from 0?





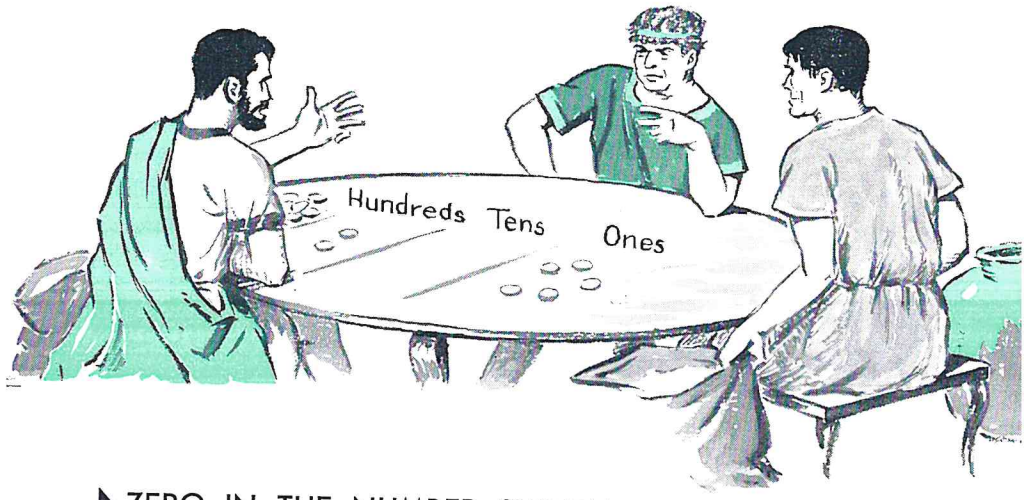
Sometimes we decide that a certain point will be called 0, and we measure from it in opposite directions.

Do you know how a thermometer works? See if you can find out and show the class.

PRACTICE

Use folded paper.

1.	$4\overline{)24}$	$7\overline{)21}$	$4\overline{)36}$	$3\overline{)24}$	$4\overline{)28}$	$9\overline{)27}$	$5\overline{)40}$	$6\overline{)36}$
2.	$4\overline{)32}$	$9\overline{)36}$	$7\overline{)49}$	$6\overline{)24}$	$9\overline{)81}$	$7\overline{)28}$	$5\overline{)45}$	$8\overline{)64}$
3.	$9\overline{)63}$	$8\overline{)56}$	$4\overline{)32}$	$7\overline{)42}$	$6\overline{)54}$	$8\overline{)72}$	$6\overline{)48}$	$9\overline{)72}$
4.	$7\overline{)35}$	$9\overline{)54}$	$6\overline{)42}$	$8\overline{)40}$	$7\overline{)56}$	$9\overline{)45}$	$8\overline{)48}$	$7\overline{)63}$



ZERO IN THE NUMBER SYSTEM

Long ago people who bought and sold things used counting tables. The table was marked to show places for ones, tens, and hundreds.

The people needed a number to show the "empty" place.

How many ones are on this table? How many hundreds?

Two hundreds are how many tens?

How many tens are on the table?

The counting table shows 2 hundreds and 5 ones. Before there was a zero, there was no digit to write when there were no counters in tens' place as in 105, 205, 305, and so on. So the people used other ways, like this, 2″5. Now we have a digit for every place for every value.

1. List the digits we use. How many different digits are there?

2. How many tens are *shown* in tens' place in 65? in 234? in 508? in 6004? in 9?

3. How many hundreds are *shown* in hundreds' place in 168? in 9265? in 8032? in 10,005? in 1039?

4. How many tens are there in 10? in 20? in 40? in 70? in 100? in 200?

NUMBERS WITH AND WITHOUT ZERO

1. Read the numbers below:

a. 206 Did you say, "Two hundred six"?
b. 2006 Did you say, "Two thousand six"?
c. 2065 Did you say, "Two thousand, sixty-five"?
d. 2604 Did you say, "Two thousand, six hundred four"?

e. Did you say the zeros in the numbers above? Would the numbers mean the same without the zeros?

2. Say these:

340 607 904 7040 3052 5506 8002

3. You know that we must add ones to ones, tens to tens, hundreds to hundreds, and so on. We keep columns straight in order to add like values.

See how Bob writes these numbers in columns to add them:

$539 + 64 + 1376 + 8$

How do you know where to write each digit?

```
 539
  64
1376
   8
----
```

Why must you keep the columns straight?

4. Do you know how to carry to a column which has no tens? See how Linda does it.

When she starts to add, are there any tens shown in the tens' column?

How many tens are in tens' place after she adds the ones? What did she do with the ten?

What is the sum of the tens' column?

```
 607
 806
 904
----
2317
```

5. Copy the numbers below in columns and add:

a. $847 + 63 + 9403 + 6$
b. $37 + 9 + 5788 + 749$
c. $744 + 3998 + 56 + 5$
d. $9 + 707 + 308$
e. $209 + 708 + 86$
f. $803 + 707 + 900$

SUBTRACTING WITH ZEROS

1. In what way are these subtraction facts alike?

$$\begin{array}{r} 10 \\ -7 \\ \hline 3 \end{array} \qquad \begin{array}{r} 10 \\ -3 \\ \hline 7 \end{array} \qquad 10 - 2 = 8 \qquad 10 - 1 = 9 \qquad \begin{array}{r} 10 \\ -4 \\ \hline 6 \end{array}$$

$$10 - 8 = 2 \qquad 10 - 9 = 1$$

2. Which one of the facts above do you need in $30 - 17$? Are you taking 7 ones from 10 ones?

3. Which of the facts above do you need in each of these?

4. Which fact above do you need in this example? (Read all three steps before you decide.) Are you taking 7 tens from 10 tens?

5. What facts do you need in the tens' columns in these?

$$\begin{array}{r} 40 \\ -26 \\ \hline \end{array} \qquad \begin{array}{r} 80 \\ -52 \\ \hline \end{array} \qquad \begin{array}{r} 30 \\ -13 \\ \hline \end{array}$$

$$\begin{array}{r} 300 \\ -170 \\ \hline \end{array} \qquad \begin{array}{r} 300 \\ -170 \\ \hline 0 \end{array} \qquad \begin{array}{r} {\scriptstyle 2\ 10} \\ 3\not{0}\not{0} \\ -170 \\ \hline 130 \end{array}$$

$$\begin{array}{r} 400 \\ -260 \\ \hline \end{array} \qquad \begin{array}{r} 800 \\ -520 \\ \hline \end{array} \qquad \begin{array}{r} 300 \\ -130 \\ \hline \end{array}$$

6. If you had \$3.00 and spent \$1.70, how much would you have left?

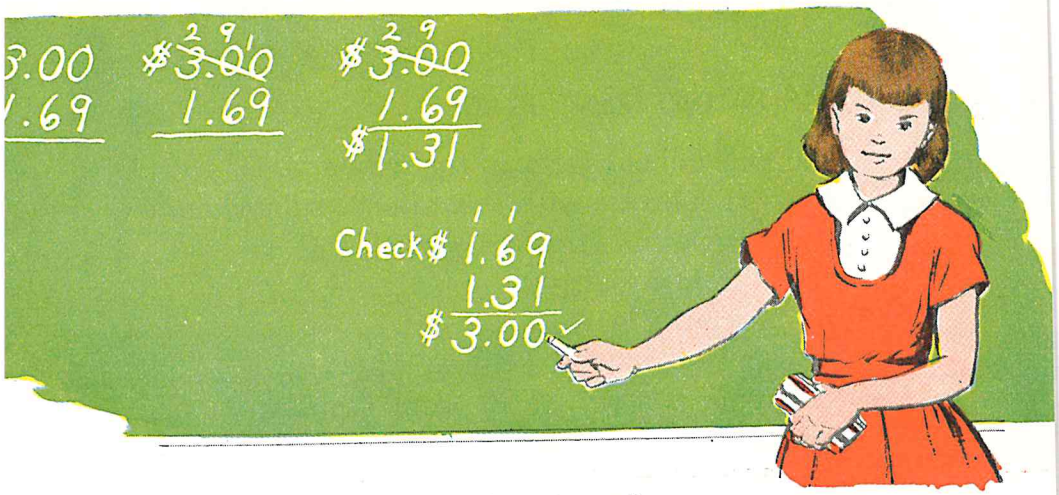
You have this	→	3 dollars	0 dimes	0 cents
You spend this	→	1 dollar	7 dimes	0 cents
You change 1 dollar to dimes	→	2 dollars	10 dimes	0 cents
You spend	→	1 dollar	7 dimes	0 cents
You have left	→	1 dollar	3 dimes	0 cents

$$\begin{array}{r} \$3.00 \\ 1.70 \\ \hline \end{array} \qquad \begin{array}{r} {\scriptstyle 2\ 10} \\ \$\not{3}.\not{0}0 \\ 1.70 \\ \hline \$1.30 \end{array}$$

PRACTICE

Copy these and subtract:

	a	b	c	d	e	f	g	h
1.	40	80	20	300	500	900	\$5.40	\$1.20
	26	53	18	140	220	670	1.80	.90
2.	60	70	90	\$1.30	\$1.50	\$5.00	\$10.00	\$12.50
	51	59	88	.25	.89	3.40	7.00	12.25



SUBTRACTING WITH ZEROS (continued)

Betty has a problem of her own. She has $3.00. If she spends $1.69 for a doll's dress, how much will she have left?

This is the way she thinks. "Nine is more than zero. So I must have a ten. Really there are 30 dimes in 3 dollars. If I take one dime, there will be 29 left. 9 from 10 is 1. 6 from 9 is 3. 1 from 2 is 1. I have $1.31 left."

"Just to be sure," Betty says, "I had better check it." She adds the remainder and the subtrahend to get the minuend. "$1.31 and $1.69. That adds up to $3.00, so I'm right."

See if Betty's way is easy. Copy these and subtract:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$3.00	$5.00	$7.00	$9.00	$4.00	$6.00	$8.00	$7.00
1.27	2.64	4.75	3.53	3.36	3.48	4.19	2.82

Change hundreds and tens together, as Betty did.

(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
500	700	600	800	900	300	800	400
362	535	474	558	513	187	521	246

ZEROS IN DIFFERENT PLACES

You know about zeros in the minuend.
Can you subtract with them in the subtrahend?

1. Examples like this are easy:
0 from 3 leaves 3.
1 from 2 leaves 1.

$$\begin{array}{r} 23 \\ -\,10 \\ \hline 13 \end{array}$$

2. This kind is done the same way: How many is 0 from 2? 0 from 4? 2 from 3?

$$\begin{array}{r} 342 \\ -\,200 \\ \hline \end{array}$$

3. This kind is different. There are 3 tens. Change 1 ten back to ones. 2 tens are left. You take 8 from 12. You now take 0 tens from 2 tens.

$$\begin{array}{r} 432 \\ -\,108 \\ \hline \end{array} \qquad \begin{array}{r} {}^{2}\cancel{4}\,{}^{12}\cancel{3}\,2 \\ -\,108 \\ \hline 324 \end{array}$$

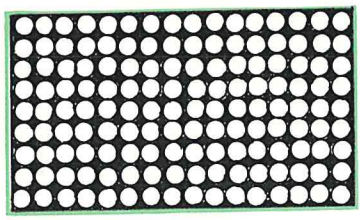
PRACTICE

Copy these and subtract:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
565	443	354	476	986	870	573	780
435	233	254	375	750	620	453	620
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
552	534	970	932	741	870	752	956
308	327	753	806	436	721	609	548
(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
923	715	801	786	917	902	528	601
750	495	645	590	747	624	330	432

Sometimes you must subtract from a zero when there doesn't seem to be a zero anywhere around. Can you think of such an example? Be ready to tell about it when you reach page 184.

GAPS AND DISAPPEARING LEFT DIGIT



1. How many is 6–6? 9–9? 1–1? How many is any number minus itself? any number minus zero?

2. Mr. Brown puts chalk in each room when it is needed. How many pieces of chalk come in a box? There are 9 pieces one way and 16 the other way.

3. Mr. Brown says it usually takes about 24 pieces each day for all of the rooms. What does "usually" mean?

4. If there are 144 pieces of chalk in a box and 24 are taken out, how many will be left?

$$\begin{array}{r} 144 \\ -\,24 \\ \hline \end{array}$$

4 ones from 4 ones are how many?

2 tens from 4 tens are how many?

There are no hundreds to subtract. There is a gap in the column. What shall we do? No hundreds from 1 hundred still leaves 1 hundred.

$$\begin{array}{r} 144 \\ -\,24 \\ \hline 120 \end{array}$$

5. In 5 days Mr. Brown would put out 120 pieces of chalk. How many would be left in the box of 144?

$$\begin{array}{r} 144 \\ -\,120 \\ \hline \end{array}$$

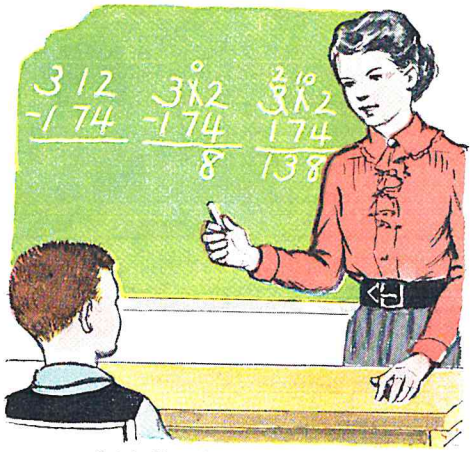
0 from 4 is what? 2 from 4 is what?

When you take 1 from 1, there is nothing left. It "disappears" in the answer. Do you need to write anything down to show that there are no hundreds when it is the column farthest left?

$$\begin{array}{r} 144 \\ -\,120 \\ \hline 24 \end{array}$$

Copy and subtract:

	a	b	c	d	e	f
6.	482 387	724 678	395 339	451 394	123 86	172 85
7.	455 357	131 88	128 99	644 576	363 268	146 97



AN UNSEEN ZERO

When do you subtract from zero when there isn't one? That's a good riddle. Tom thought and thought. He couldn't see how to make a zero out of another number. His teacher showed him. She did it this way:

A. "I need to take 174 from 312," she said. Look at the example on the chalkboard above.

B. "Four ones are more than 2 ones. I need 10 ones, so I take a ten. There is only one ten in tens' place. When I take it, there are no tens left in the tens' column. So I write a zero."

C. "I know what to do now," said Tom. "Let me finish it."

Seven tens are more than 0 tens. So Tom changed a hundred back to 10 tens. This left 2 hundreds instead of 3 hundreds.

Tom then took 7 tens from 10 tens.

He next took 1 hundred from 2 hundreds.

PRACTICE

Copy these and subtract:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
812	414	513	614	417	713	915	714
667	298	376	465	278	597	789	486

(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
501	317	223	115	206	113	345	805
444	239	115	47	169	14	248	736

TESTING SUBTRACTION WITH ZEROS

Copy these and subtract:

	a	b	c	d	e	f	g	h
1.	751	866	753	558	570	134	909	190
	603	670	549	388	447	23	734	36
2.	344	865	638	453	707	253	664	590
	90	806	58	370	83	248	594	557
3.	509	113	175	109	614	132	915	106
	446	73	80	67	495	72	759	21
4.	404	202	103	313	304	401	101	112
	58	197	96	249	46	238	34	43

PROBLEMS

1. How much change will Betty receive from \$2.00? She is buying a handbag for \$1.59.

2. Jim went to the store with \$1.50. He came home with \$1.13. How much did he spend?

3. How many invitations does the committee still need to make? They have made 36 and need 60 in all.

4. How many stamps have Dot and Sue together? Dot has 110 stamps and Sue has 84.

5. What is the difference between the prices of afternoon and evening movies? One costs 35¢ and the other 50¢.

6. How much has the temperature fallen in 4 hours? It was 70° at 1:00 P.M. and is 46° at 5:00 P.M.

7. Bob and Jack have a trick. Both step on the scales and weigh 150 lb. Bob steps off and Jack weighs 78 lb. What does Bob weigh?

MULTIPLYING WITH ZEROS

$$\begin{array}{r} 201 \\ \times 4 \\ \hline 804 \end{array}$$

1. Jim's dad makes a trip of 201 miles each week. How far is this in 4 weeks? What does the zero in the multiplicand tell us?

4 ones are _?_.
4 zeros are _?_.
4 twos are _?_.

$$\begin{array}{r} {\scriptstyle 1}\,3\,2\,4 \\ \times 3 \\ \hline 972 \end{array}$$

2. We know how to carry to tens. 3 fours are 12. Carry the ten. 3 twos are 6. 6 tens and the 1 ten we carried are 7 tens.

$$\begin{array}{r} {\scriptstyle 1}\,3\,0\,4 \\ \times 3 \\ \hline 912 \end{array}$$

3. This example has no tens in tens' place. 3 fours are 12. Carry the 1 ten. 3 zeros are 0. 0 tens and 1 ten are 1 ten.

$$\begin{array}{r} {\scriptstyle 7}\,4\,0\,9 \\ \times 8 \\ \hline 3272 \end{array}$$

4. 8 nines are 72. What number do you carry? Tell how you finish the example.

5. Jack's mother found shirts that were just what Jack wanted. "I'll take 4," she said. "They are so hard to find. We'll stock up." The shirts were \$2 each, and the sales tax was 6¢ each. What did 4 cost all together?

$$\begin{array}{r} \$2.06 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} \$1.04 \\ \times 5 \\ \hline \end{array}$$

6. How much will 5 books cost at \$1 each if the sales tax is 4¢ each?

7. How much will 5 dolls cost at \$2 each if the sales tax is 6¢ each?

$$\begin{array}{r} \$2.06 \\ \times 5 \\ \hline \end{array}$$

8. How much will 4 balls cost at \$2.08 each?

9. How much will 5 meals cost at \$1.03 each?

HOW WELL DO YOU KNOW?

Set 1. Addition

	a	b	c	d	e	f	g
1.	538	864	789	86	956	264	139
	428	273	5	992	45	38	63
	226	54	856	22	7	1	100
2.	79	78	69	68	39	65	47
	43	65	68	47	77	98	89
	94	38	94	76	57	59	98
	3	37	70	9	65	87	59

Set 2. Subtraction

	a	b	c	d	e	f	g
1.	119	1234	1224	656	163	500	303
	26	436	975	587	79	496	268
2.	410	1038	1207	545	517	320	646
	398	959	878	479	439	258	549

Set 3. Division

	a	b	c	d	e	f	g
1.	$7\overline{)49}$	$9\overline{)36}$	$9\overline{)54}$	$5\overline{)30}$	$8\overline{)56}$	$4\overline{)28}$	$9\overline{)63}$
2.	$3\overline{)279}$	$8\overline{)408}$	$8\overline{)648}$	$5\overline{)455}$	$7\overline{)357}$	$4\overline{)288}$	$6\overline{)426}$
3.	$7\overline{)637}$	$4\overline{)364}$	$7\overline{)427}$	$4\overline{)328}$	$7\overline{)567}$	$8\overline{)488}$	$6\overline{)546}$

Set 4. Multiplication

	a	b	c	d	e	f	g	h
1.	201	103	202	304	201	402	302	203
	4	3	4	2	3	2	3	2
2.	204	306	104	208	206	309	305	407
	4	3	6	4	6	5	8	5

THINKING ABOUT CARRYING AGAIN

A

548
436
789
(2)3
(1)5
16
1773

B

12
548
436
789
1773

▶ DIFFERENT WAYS TO CARRY

1. Don claims he adds without carrying. Does he? Or does he just carry by using a long way? Does Don's *23* in A show tens and ones? Does the carry number *2* in B show tens?

2. Look at the way Don multiplies. Then look at Ann's way. Count the number of digits each one wrote. Could Ann multiply her way by using only 6 digits? Why is Ann's way better?

Joe says Don is just writing carry numbers in a different place.

Jerry says his dad showed him a way to add by starting with hundreds. *A*, *B*, and *C* show in three steps what Jerry did. Can you explain them? The digits in heavy type show how he added. What is the purpose of the lines?

DON'S	ANN'S
45	1 45
3	3
15	135
12	
135	

A

5	4	8
4	3	6
7	8	9
1	**6**	

B

5	4	8
4	3	6
7	8	9
1	6	**5**
	1	

C

5	4	8
4	3	6
7	8	9
1	6	5 **3**
	1	**2**
1	7	7 3

Sandra says, "It doesn't make much difference how you carry if every digit is kept in its right place."

▶ USING PLACE VALUE WHEN YOU ESTIMATE

1. Six classes eat in the cafeteria at one time. About how many children are in the six classes all together? The numbers in the classes are 32, 35, 31, 36, 31, and 33.

Jerry says his way of thinking tens first helps. There are 6 threes in the tens' places. That is 180. There are nearly 20 in the ones' places. That makes about 200.

2. Jim says he averages selling about 28 papers a day. About how many is that in 5 days? Is it as many as 5 times 3 tens (30)?

$$\begin{array}{r} 28 \\ \times 5 \\ \hline \end{array} \qquad \begin{array}{r} 20 + 8 \\ 5 \quad\; 5 \\ \hline 100 + 40 \end{array}$$

Jim says 5 twenties are 100.
5 eights are 40. So 5×28 is 140.

3. Peg's family is going to take a 1600-mile trip in 5 days. About how far should they travel daily? Peg says 16 hundreds $\div$ 5 is over 3 hundreds, but is not 4 hundreds.

4. About how many hundred sheets of paper will the school need for a 5-day week if its 495 children use one sheet apiece every day?

5. About how many hundred miles is it to Boston if it is 198 miles to Kent, 190 miles from there to Center, and 295 miles from there to Boston?

6. Write your estimate in hundreds and tens for each addition. Then add to check your estimate.

a. 28	**b.** 64	**c.** 32	**d.** 65
10	50	59	47
40	37	78	90
e. 96	**f.** 48	**g.** 77	**h.** 52
76	7	83	51
57	94	79	48

USING LARGER CARRY DIGITS

$7 \times 8 = 56$
$7 \times 2 = 14$
$14 + 5 = 19$

5
28
× 7
196

1. Look at Linda's multiplications. What is the carry digit when she multiplies 7×8?

2. Will the carry digit be larger if she multiplies 29 by 7?

3. What will the carry digit be in each of these? Write the carry digit on an answer sheet; then copy and multiply.

a. 26 × 9	**b.** 27 × 8	**c.** 24 × 9	**d.** 29 × 5
e. 38 × 9	**f.** 46 × 6	**g.** 58 × 6	**h.** 69 × 9

PRACTICE

Copy these and multiply:

(1) 32 × 6	(2) 45 × 3	(3) 92 × 9	(4) 48 × 2	(5) 32 × 7	(6) 79 × 2	(7) 73 × 5	(8) 96 × 6	(9) 85 × 7
(10) 42 × 8	(11) 84 × 5	(12) 86 × 3	(13) 46 × 4	(14) 83 × 9	(15) 35 × 4	(16) 93 × 8	(17) 48 × 6	(18) 58 × 8
(19) 69 × 5	(20) 94 × 9	(21) 97 × 3	(22) 53 × 9	(23) 75 × 6	(24) 94 × 7	(25) 57 × 8	(26) 96 × 5	(27) 97 × 7
(28) 86 × 8	(29) 74 × 9	(30) 68 × 7	(31) 97 × 4	(32) 57 × 7	(33) 79 × 6	(34) 84 × 4	(35) 86 × 9	(36) 64 × 7

UNSEEN NUMBERS IN PROBLEMS

Sometimes you must use numbers to solve problems when the numbers are not in the problems. You think them, but they are not seen until you write them.

Jane's father drives to work every day. He goes 12 miles each way. How far is the round trip?

Round trip means there and back. The unseen number is 2 because round trip means both ways.

What numbers do you multiply to get the answer?

Find the answers to these problems. You will need an unseen number for some of them. In each problem name the number you need but cannot see.

1. David and Don are comparing the lengths of their outdoor basketball courts. David measured his. He got 42 ft. Don's measured 18 yd. What is the difference in the lengths?

2. David's court is 30 ft. wide and Don's is 9 yd. What is the difference?

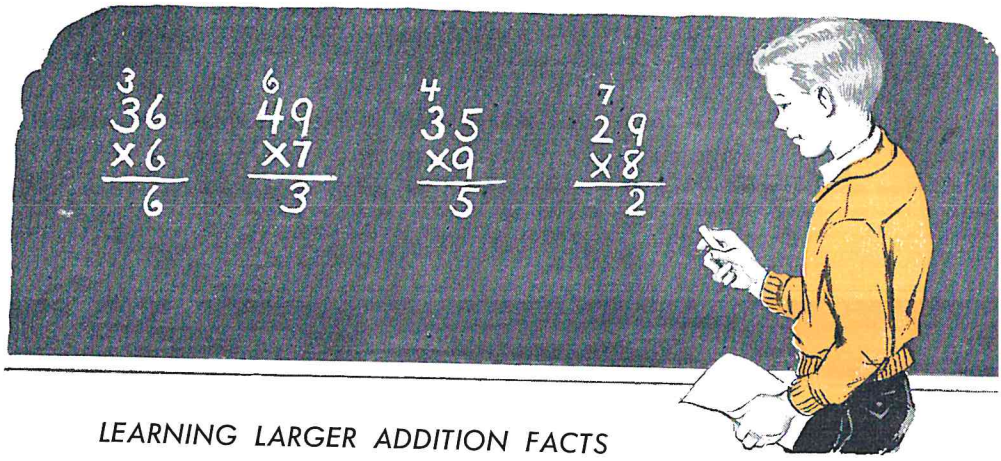
3. A farmer sold 18 gallons of milk today. How many quarts is that?

4. Our school uses 68 quarts of milk in a school day. How many pints is that? How many half pints?

5. How many inches long is an 8-ft. bookshelf?

6. Dick says our library books are about an inch thick. How many of the books will 9 yd. of shelf space hold? How many inches are 9 yards?

7. In Cathy's room there are 8 bookshelves. One has 36 books on it. All others have about the same number. About how many hundred books are there?



LEARNING LARGER ADDITION FACTS

Joe has found some troublemakers. He knows the multiplication facts, but some of the carry facts trouble him. Look at all of his examples.

1. In the first example, Joe multiplies 6×3 and adds the carry number 3. $\mathbf{18 + 3 = 21}$ is the carry fact. In the next example, $7 \times 4 = 28$, so $\mathbf{28 + 6 = 34}$ is the carry fact. Tell the carry facts for the other examples.

2. Joe found an easy way to learn the carry facts. He thinks about the ending (the ones) first. He says, "18 and 3 ends in 1; 21. 28 and 6 ends in 4; 34. 27 and 4 ends in 1; 31. 16 and 7 ends in 3; 23." How do you think Joe knows if the tens' digit will be one more?

It helps Joe to think about the ones' ending, but he should learn the answers so that he can say them almost without thinking.

3. Joe must think to see if adding the ones changes the tens. He thinks, "48 and 3 will be in the **fifties.** 42 and 5 in the **forties.**"

a. Will 36 and 5 be in the thirties or forties?
b. 56 and 6 will be in the _?_.
c. 45 and 4 in the _?_.
d. 54 and 7 in the _?_.
e. 63 and 6 in the _?_.

PRACTICE WITH CARRY FACTS

Finish these multiplications. Write the whole answer for each on folded paper.

1. $^{4}87$	$^{5}78$	$^{5}69$	$^{3}69$	$^{6}78$	$^{4}35$	$^{5}67$	$^{7}68$
$\times\ 6$	$\times\ 7$	$\times\ 6$	$\times\ 4$	$\times\ 8$	$\times\ 9$	$\times\ 8$	$\times\ 9$
$\overline{2}$	$\overline{6}$	$\overline{4}$	$\overline{6}$	$\overline{4}$	$\overline{5}$	$\overline{6}$	$\overline{2}$

2. Practice saying the answers to the carry facts below.

3. Number an answer strip for 36 answers. Your teacher will then read the examples.

(1)	(10)	(19)	(28)
48 and 4	27 and 6	49 and 4	28 and 4
45 and 6	63 and 7	64 and 7	27 and 8
49 and 2	35 and 3	49 and 6	72 and 8
36 and 5	28 and 5	54 and 8	36 and 7
49 and 5	64 and 6	32 and 7	48 and 5
24 and 2	56 and 5	27 and 5	56 and 4
45 and 7	48 and 6	48 and 7	42 and 5
28 and 6	63 and 8	56 and 6	36 and 8
49 and 3	56 and 7	48 and 3	27 and 7

PRACTICE

Copy these and multiply. Don't write the carry digits.

	a	b	c	d	e	f	g	h
1.	63	46	65	79	97	48	68	79
	$\times\ 8$	$\times\ 9$	$\times\ 7$	$\times\ 4$	$\times\ 6$	$\times\ 7$	$\times\ 4$	$\times\ 8$
2.	36	58	68	68	96	79	78	84
	$\times\ 6$	$\times\ 9$	$\times\ 8$	$\times\ 3$	$\times\ 7$	$\times\ 5$	$\times\ 9$	$\times\ 6$
3.	97	64	68	75	86	79	78	79
	$\times\ 3$	$\times\ 8$	$\times\ 5$	$\times\ 8$	$\times\ 7$	$\times\ 6$	$\times\ 4$	$\times\ 7$

CARRYING TO HUNDREDS

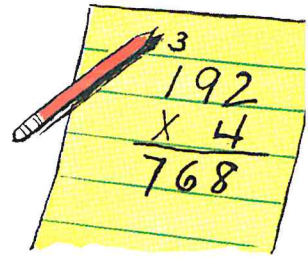
1. Mike had 8 new books of stories. He wondered how long it would take him to read them.

Mike looked at the number of pages in some of them. The first one had 208 pages. The next had 192 pages. The next also had 192. The fourth had 208.

"I estimate about 200 pages in each book," said Mike. How many is 8 × 2 hundred?

2. Four of Mike's books had 192 pages each. "I wonder what the exact number is for all 4 books," said Mike. "I know it will be less than 800."

How could Mike tell that there would be less than 800 pages?



Mike multiplied to find the exact number of pages. He thought, "4 twos are 8. 4 nines are 36. 4 ones are 4. 4 and 3 are 7."

• You carry to hundreds the same way you carry to tens.

3. Study each example below and decide whether or not you will need to carry to hundreds. Then copy the examples and find the products.

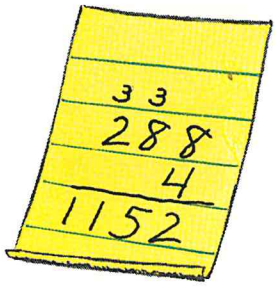
a. 473 × 3	**b.** 346 × 2	**c.** 641 × 9	**d.** 461 × 8	**e.** 741 × 6	**f.** 216 × 4
g. 213 × 2	**h.** 461 × 7	**i.** 325 × 3	**j.** 308 × 6	**k.** 618 × 5	**l.** 580 × 4

CARRYING TO TENS AND HUNDREDS

1. Bill looked for the numbers of pages in some of his books. One had 288 pages.

"Four books that long would be plenty for me to read," said Bill.

Tell how Bill multiplied to find 4×288 pages.



2. Copy and multiply the examples below:

a. 189 × 4	**b.** 295 × 6	**c.** 349 × 2	**d.** 396 × 3	**e.** 394 × 5	**f.** 469 × 7
g. 572 × 4	**h.** 538 × 7	**i.** 518 × 9	**j.** 269 × 7	**k.** 751 × 5	**l.** 825 × 8

PRACTICE

Copy the examples below and find the answers:

1. $379 + 756$
2. $127 - 39$
3. $876 - 349$
4. $163 - 85$
5. 7×96
6. $36 \div 4$
7. $638 + 466$
8. $753 - 694$
9. $456 - 369$
10. $54 \div 6$
11. $663 - 568$
12. 8×47
13. $409 + 68 + 753$
14. $29 + 7 + 497$
15. $875 + 549 + 8$
16. $53 + 309 + 37$
17. $637 + 79 + 808$
18. $658 + 769 + 875$

▶ MULTIPLYING DOLLARS

1. Phil and his mother found a good shirt for him. "How much is it?" asked Phil's mother. "$3.00." "I'll take three of them," she said.

How much would 3 shirts cost all together? $3 \times \$3$, or $3 \times \$3.00$. You can write it either way. Are there any cents?

$$\begin{array}{r} \$3.00 \\ \times\ 3 \\ \hline \$9.00 \end{array}$$

2. Phil and his mother saw two dolls for his sisters. The tag on each read $6.00. How much would both cost?

$$\begin{array}{r} \$\ 6.00 \\ \times\ 2 \\ \hline \$12.00 \end{array}$$

3. At another store, Phil's father bought 4 tires for $20.00 each. How much is that for all 4?

$$\begin{array}{r} \$20 \\ \times\ 4 \\ \hline \$80 \end{array} \quad \text{or} \quad \begin{array}{r} \$20.00 \\ \times\ 4 \\ \hline \$80.00 \end{array}$$

4. Tell what you think might have been bought in these examples:

a. $\begin{array}{r} \$\ 6.00 \\ \times\ 6 \\ \hline \$36.00 \end{array}$ **b.** $\begin{array}{r} \$\ 2.00 \\ \times\ 7 \\ \hline \$14.00 \end{array}$ **c.** $\begin{array}{r} \$\ 4.00 \\ \times\ 5 \\ \hline \$20.00 \end{array}$ **d.** $\begin{array}{r} \$1.00 \\ \times\ 9 \\ \hline \$9.00 \end{array}$ **e.** $\begin{array}{r} \$\ 3.00 \\ \times\ 8 \\ \hline \$24.00 \end{array}$

ESTIMATING MULTIPLICATION OF DOLLARS AND CENTS

1. Four gallons of oil to take home for the car cost $1.50 per gallon. Phil multiplied it this way.

$$\begin{array}{r} \$1.50 \\ \times 4 \\ \hline \$6.00 \end{array}$$

Phil's younger sister thought it out her own way. "Four half dollars are the same as two whole dollars. Add 2 dollars to 4 dollars and you get 6 dollars."

2. Will 4 balls at $1.23 each cost about $5.00? Can you imagine 4 dollars and 4 quarter dollars in the example?

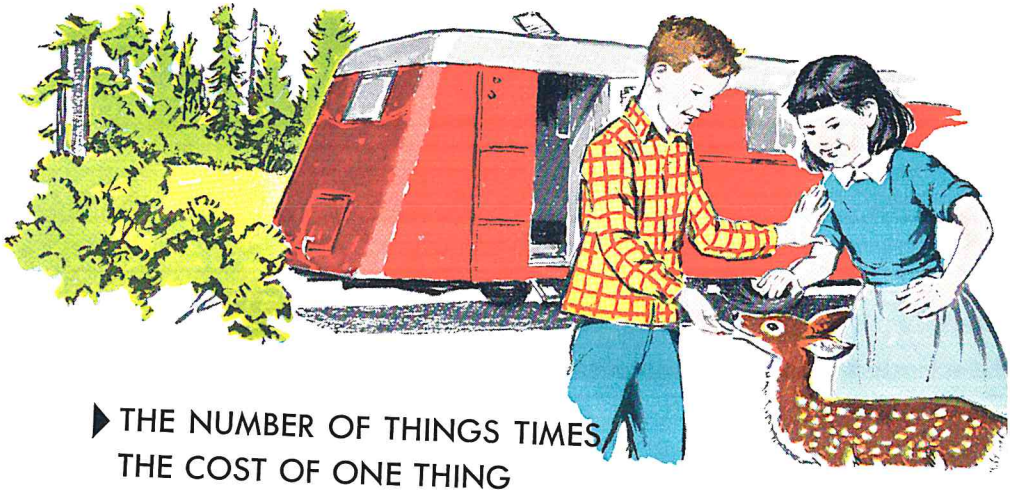
$$\begin{array}{r} \$1.23 \\ \times 4 \\ \hline \end{array}$$

3. About what will 5 doll dresses cost at $1.19 each? Can you imagine 5 × 20¢ and 5 × $1 in the example?

$$\begin{array}{r} \$1.19 \\ \times 5 \\ \hline \end{array}$$

4. Write on an answer sheet your estimate of the number of dollars for each multiplication below. Then multiply and compare.

a. $4.05 × 4	**b.** $2.40 × 3	**c.** $ .98 × 2	**d.** $3.15 × 5	**e.** $2.10 × 6
f. $7.48 × 2	**g.** $2.10 × 8	**h.** $2.26 × 4	**i.** $1.10 × 9	**j.** $1.30 × 7
k. $2.80 × 6	**l.** $3.80 × 2	**m.** $2.50 × 8	**n.** $ .39 × 5	**o.** $ .25 × 9
p. $1.40 × 8	**q.** $3.52 × 4	**r.** $1.40 × 7	**s.** $5.60 × 3	**t.** $2.59 × 5



THE NUMBER OF THINGS TIMES THE COST OF ONE THING

1. Peg and Paul are lucky. Their family has rented a trailer for a trip to the park. "You must help figure the cost of food," Dad said.

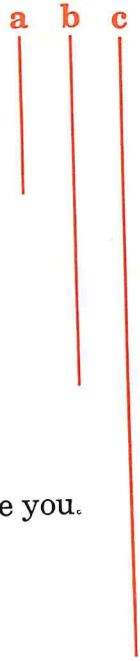
Mark a paper like the one at the right and add the totals. What Peg and Paul bought and the prices are given below from (**a**) through (**i**). The first item has been listed for you. Are the prices today about the same as theirs were?

Amount and Name	Cost Each	Total
5 lb. bananas	$0.16	$0.80

a. 5 lb. of bananas at 16¢ per lb.
b. 4 cans of peas at 37¢ per can.
c. 3 cans of beans at 29¢ per can.
d. 2 lb. of butter at 78¢ per lb.
e. 3 doz. eggs at 68¢ per doz.
f. 12 lb. of oranges at 9¢ per lb.
g. 2 cans of salmon at 58¢ per can.
h. 3 loaves of bread at 24¢ each.
i. 4 qt. of milk at 19¢ per qt.

You know what one thing costs. How do you find out what many of the things cost? Add, subtract, multiply, divide?

2. How many days do you think the food will last?
3. Which of these things will probably be used up first?



HOW WELL DO YOU ESTIMATE MEASURES?

1. Estimate the length of line (**a**). line (**b**). line (**c**).

2. Draw a line 2 inches long without using a ruler; one 6 inches; one 8 inches. Measure to see how close you came.

3. Estimate how many feet and yards it is between marks on the chalkboard. This can be a guessing game.

4. Estimate the weight of books of different sizes. Then weigh them and compare.

5. Estimate the temperature outdoors.

6. Try to estimate a minute. Get someone to time you.

TESTING YOURSELF

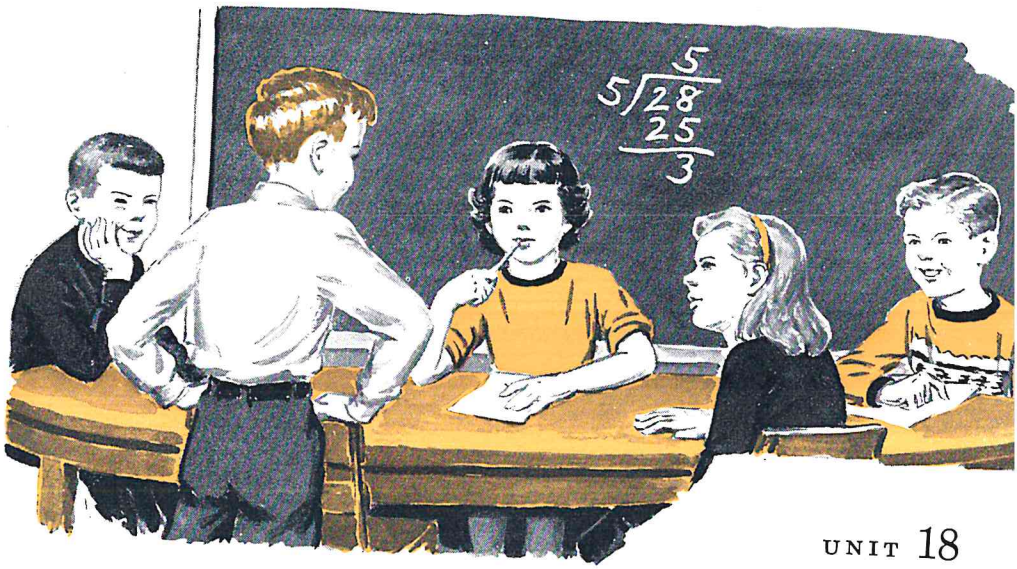
Use an answer strip.

(1)	(11)	(1)	(11)	(1)	(11)
13 − 6	16 − 7	7 × 4	9 × 6	36 ÷ 9	48 ÷ 6
14 − 8	13 − 9	6 × 8	8 × 5	24 ÷ 4	32 ÷ 4
12 − 7	15 − 6	5 × 6	7 × 6	56 ÷ 8	45 ÷ 5
14 − 5	13 − 4	3 × 8	8 × 8	27 ÷ 9	56 ÷ 7
15 − 9	15 − 8	9 × 4	7 × 5	54 ÷ 6	42 ÷ 6
(6)	(16)	(6)	(16)	(6)	(16)
17 − 8	14 − 9	8 × 7	6 × 9	40 ÷ 8	54 ÷ 9
13 − 7	13 − 8	5 × 8	8 × 6	35 ÷ 7	49 ÷ 7
11 − 3	15 − 7	4 × 6	4 × 7	63 ÷ 9	72 ÷ 9
17 − 9	14 − 6	3 × 9	5 × 9	64 ÷ 8	63 ÷ 7
13 − 5	16 − 9	9 × 7	9 × 8	28 ÷ 4	42 ÷ 7

Place two things on the playground.

a. Estimate the distance between them first by looking and then by stepping.

b. Measure the distance and compare.



UNIT 18

UNEVEN DIVISION

A SCHOOL TRIP

1. Miss Adams' room is planning a trip to see a market. There are 28 children. Five children can go in one car. How many fives are there in 28?

5 fives are 25. 28 is 25 and 3 left over.

Five cars can take 25 children, but there will be 3 children left over. What shall be done with the three children? Have you any ideas?

2. Suppose there were 28 marbles to divide among 5 children. What would you do with the 3 left over?

3. How might two people divide 5 apples? What could they do with the one left over?

4. What can you do with apples that you cannot do with children or marbles?

5. If two girls divide 5 dolls equally, how many will be left over?

How many ways can two boys divide 3 dimes equally?

HOW MANY LEFT OVER?

1. At playtime someone cries, "Three-deep." The children rush to line up in pairs. The one left over is "it."

How many twos can you subtract from 7?

$$\begin{array}{r} 3 \\ 2\overline{)7} \\ \underline{6} \\ 1 \end{array}$$

2. How many twos are there in 7? 3 twos are 6. ← Subtract the 3 twos all at once.

Are there 3 twos in 7 and 1 left over?

3. How many 2's in 9? Why is 8 written under 9?

What does the 1 mean?

$$\begin{array}{r} 4 \\ 2\overline{)9} \\ \underline{8} \\ 1 \end{array}$$

4. How many 3's in 17? Why is 15 written under 17?

What does the 2 mean?

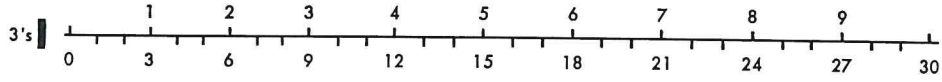
You can write the answer, *5 and 2 over.*

$$\begin{array}{r} 5 \\ 3\overline{)17} \\ \underline{15} \\ 2 \end{array}$$

5. Below are 18 examples. Some are partly done. Finish all of them. Use counters if they help you.

	a	b	c	d	e	f
6.	$\begin{array}{r} 2 \\ 2\overline{)5} \\ \underline{4} \end{array}$	$\begin{array}{r} 7 \\ 2\overline{)15} \\ \underline{14} \end{array}$	$\begin{array}{r} 4 \\ 3\overline{)14} \\ \underline{12} \end{array}$	$\begin{array}{r} 5 \\ 4\overline{)23} \\ \underline{20} \end{array}$	$\begin{array}{r} 5 \\ 5\overline{)27} \\ \underline{25} \end{array}$	$\begin{array}{r} 4 \\ 6\overline{)25} \\ \underline{24} \end{array}$
7.	$\begin{array}{r} 4 \\ 4\overline{)19} \end{array}$	$\begin{array}{r} 5 \\ 6\overline{)31} \end{array}$	$\begin{array}{r} 7 \\ 3\overline{)23} \end{array}$	$\begin{array}{r} 7 \\ 5\overline{)37} \end{array}$	$\begin{array}{r} 6 \\ 2\overline{)13} \end{array}$	$\begin{array}{r} 3 \\ 5\overline{)18} \end{array}$
8.	$5\overline{)44}$	$3\overline{)28}$	$7\overline{)25}$	$6\overline{)29}$	$8\overline{)27}$	$9\overline{)20}$

▶ PRODUCT LINES TO HELP YOU



Each number above the line shows how many threes there are in the number below it.

How many 3's are there in 13?

Find the mark that stands for 13.

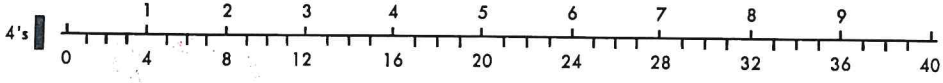
In the table of threes, the largest product of 3 in 13 is 12. We say, "There are 4 threes in 13 and 1 over."

1. How many 3's in 17? 5 and 2 over.

2. How many 3's in 22? in 7? in 24? in 11? in 29?

3. How many 3's in 10? in 14? in 23? in 28? in 20?

4. How many 3's in 13? in 8? in 26? in 19? in 16?

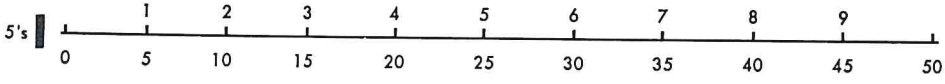


Copy these. Find the quotient and the number left over.

5. $4\overline{)9}$ $4\overline{)14}$ $4\overline{)19}$ $4\overline{)29}$ $4\overline{)26}$ $4\overline{)38}$ $4\overline{)33}$

6. $4\overline{)17}$ $4\overline{)10}$ $4\overline{)21}$ $4\overline{)34}$ $4\overline{)13}$ $4\overline{)37}$ $4\overline{)25}$

7. $4\overline{)15}$ $4\overline{)22}$ $4\overline{)11}$ $4\overline{)35}$ $4\overline{)18}$ $4\overline{)27}$ $4\overline{)31}$



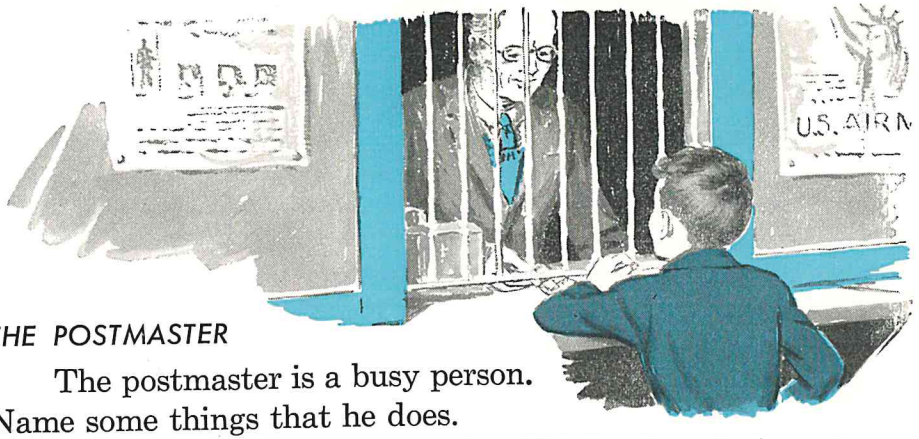
In the line above, you think the numbers between the products. Between which products does 27 come? 43? 36?

Copy these. Find the quotient and the number left over.

8. $5\overline{)22}$ $5\overline{)17}$ $5\overline{)14}$ $5\overline{)43}$ $5\overline{)32}$ $5\overline{)48}$ $5\overline{)27}$

9. $5\overline{)26}$ $5\overline{)19}$ $5\overline{)39}$ $5\overline{)23}$ $5\overline{)44}$ $5\overline{)28}$ $5\overline{)47}$

10. $5\overline{)42}$ $5\overline{)24}$ $5\overline{)37}$ $5\overline{)29}$ $5\overline{)46}$ $5\overline{)33}$ $5\overline{)36}$



THE POSTMASTER

The postmaster is a busy person. Name some things that he does.

1. Steve gave the postmaster 15¢ for 2-cent stamps. How many stamps should he get? How much change should he get back?

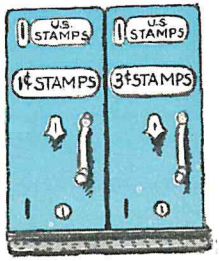
2. How many 3-cent stamps can Steve buy for 25¢? What should his change be?

3. Two dimes will buy how many 3-cent stamps? How much change will there be?

4. How many 4-cent stamps can be bought for 35¢? What should the change be?

5. Bob has a half dollar. "Please give me 6-cent stamps," he says. How many 6-cent stamps should he get? How much change?

6. It costs 33¢ to mail a package. "Five sixes and a three," thinks the postmaster. Is he right?



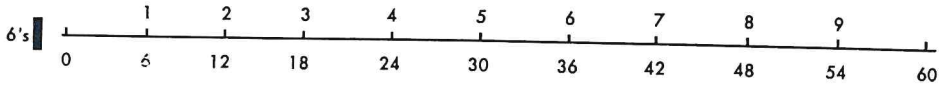
7. A dime put into a stamp selling machine will buy 3 three-cent stamps. How much do you pay for the use of the machine?

8. How much does it cost to send a letter to New York or Chicago? Does it cost less to send a letter across your home town?

Bonnie is mailing a package. "It will be 23¢," says the postmaster. Bonnie has 2-cent, 3-cent, 5-cent, and 6-cent stamps. What are some of the ways she can put 23¢ in stamps on the package?

MORE PRODUCT LINES

This time you think the number of sixes.



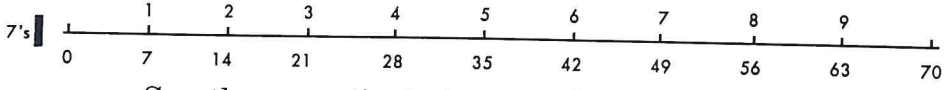
Say these quotients to yourself:

1. $6\overline{)12}$ $6\overline{)30}$ $6\overline{)18}$ $6\overline{)54}$ $6\overline{)42}$ $6\overline{)24}$ $6\overline{)48}$ $6\overline{)36}$

Copy these. How many 6's and how many left over?

	a	b	c	d	e	f	g	h
2.	$6\overline{)27}$	$6\overline{)25}$	$6\overline{)20}$	$6\overline{)33}$	$6\overline{)51}$	$6\overline{)37}$	$6\overline{)22}$	$6\overline{)32}$
3.	$6\overline{)19}$	$6\overline{)34}$	$6\overline{)56}$	$6\overline{)26}$	$6\overline{)21}$	$6\overline{)16}$	$6\overline{)57}$	$6\overline{)46}$
4.	$6\overline{)59}$	$6\overline{)55}$	$6\overline{)39}$	$6\overline{)23}$	$6\overline{)44}$	$6\overline{)49}$	$6\overline{)58}$	$6\overline{)47}$
5.	$6\overline{)38}$	$6\overline{)28}$	$6\overline{)52}$	$6\overline{)35}$	$6\overline{)53}$	$6\overline{)29}$	$6\overline{)45}$	$6\overline{)59}$

How many sevens?



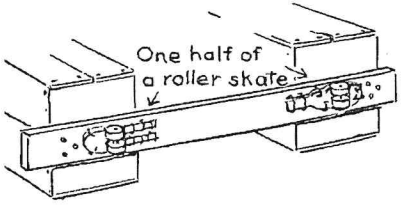
Say these quotients to yourself:

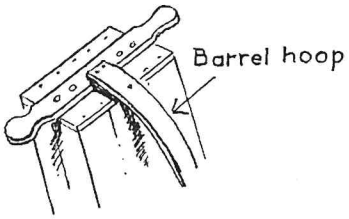
6. $7\overline{)14}$ $7\overline{)35}$ $7\overline{)21}$ $7\overline{)56}$ $7\overline{)28}$ $7\overline{)49}$ $7\overline{)63}$ $7\overline{)42}$

Copy these. How many 7's and how many left over?

	a	b	c	d	e	f	g	h
7.	$7\overline{)17}$	$7\overline{)24}$	$7\overline{)44}$	$7\overline{)31}$	$7\overline{)65}$	$7\overline{)37}$	$7\overline{)53}$	$7\overline{)62}$
8.	$7\overline{)23}$	$7\overline{)45}$	$7\overline{)30}$	$7\overline{)41}$	$7\overline{)54}$	$7\overline{)34}$	$7\overline{)67}$	$7\overline{)52}$
9.	$7\overline{)19}$	$7\overline{)58}$	$7\overline{)26}$	$7\overline{)46}$	$7\overline{)33}$	$7\overline{)66}$	$7\overline{)38}$	$7\overline{)61}$
10.	$7\overline{)27}$	$7\overline{)47}$	$7\overline{)55}$	$7\overline{)32}$	$7\overline{)60}$	$7\overline{)39}$	$7\overline{)51}$	$7\overline{)69}$
11.	$7\overline{)20}$	$7\overline{)50}$	$7\overline{)25}$	$7\overline{)48}$	$7\overline{)40}$	$7\overline{)59}$	$7\overline{)68}$	$7\overline{)57}$

● The number left over is called the **remainder.** Why must the remainder be smaller than the divisor?





HOW TO DO IT

1. Do you add, multiply, subtract, or divide?

On Saturday six boys in Bob's den are going to Bob's home to make roller skate scooters. Mr. Gordon is helping them plan.

a. You know how many scooters to make. One pair of skates makes 2 scooters. How do you find how many pairs of skates you need?

b. You count the number of screws there are. How many screws are there for each boy?

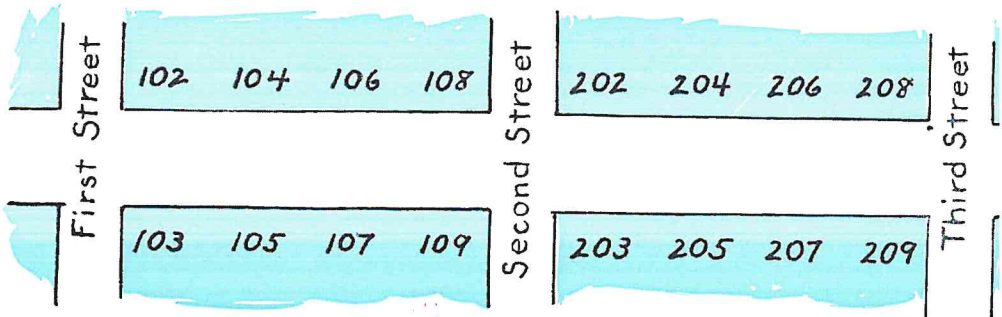
c. You know how many boards are needed for each scooter. How do you find how many boards will be needed for 6 scooters?

d. You know how many bolts each scooter needs. How do you find out how many bolts will be needed for all of the scooters?

2. What do you need to know?

a. You have a long board. You must cut it into shorter lengths. What should you know before you start?

b. You need two boxes for each scooter. What should you know before you start to look for boxes?



HOUSE NUMBERS

1. Look at the digits in the ones' places. On one side of the street they are 2, 4, 6, and 8. All of these numbers can be divided by 2, and there will be none left over. They are *even* numbers.

2. Now look at the ones' places in the numbers on the other side of the street. They are 3, 5, 7, and 9. If these are divided by 2, there will be 1 left over for each of them. These numbers are called *odd* numbers.

3. All the numbers in the block between First and Second Streets have a one in the hundreds' place.

What is the hundreds' place number in the next block?

4. Do the numbers get larger or smaller as you go from First Street to Second Street?

Street numbers may tell three things:

a. The ones' place may tell which side of the street.

b. In most cities the tens' place tells which end of the block.

c. In most cities the hundreds' place helps to tell which part of the city.

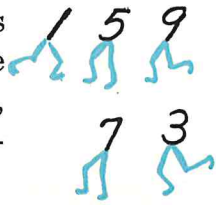
5. If you live in a city, what do the numbers on the houses in your city tell you?

6. Why does a mail carrier need numbers on houses?

7. If you live on a farm, do you have a mailbox number? How does the number help the mail carrier?

ODD OR EVEN

1. Count by twos. Begin with 2, this way: 2, 4, 6, 8, 10, 12, and so on. These are *even* numbers. Begin with 1, this way: 1, 3, 5, 7, 9, 11, 13, and so on. These are *odd* numbers.



2. Don wants to divide his class of 30 into two groups for games. "Number off," he calls out. This is the way the class divides. Each takes a number, 1, 2, 3, 4, and so on, until all 30 are numbered. Then Don calls out, "The odds over here and the evens on this side." Will the sides be divided equally?

Numbers which can be divided by 2 with not any left over, are called *even* numbers.
Numbers divided by 2 which have 1 left over, are called *odd* numbers.

3. Find the 3 numbers in this group which are even:

5 8 11 67 24 17 16 23 45

4. Find the 3 numbers in this group which are odd:

4 16 9 28 18 23 44 65 42

5. Can you always tell an odd number or an even number by the digit in its ones' place?

Try to tell if these are odd or even by looking at the ones' digit first. Then check.

12 15 25 48 32 93 76 87

6. Which of these numbers are odd? Which are even?

26 64 83 85 66 103 142 167
49 18 28 162 148 227 121 189

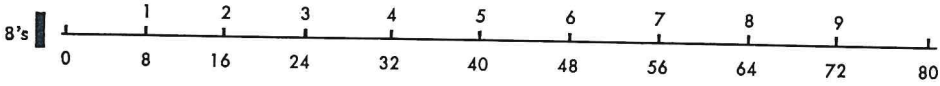
Odd or even?

$2\overline{)300}$

$2\overline{)70}$

$2\overline{)500}$

PRODUCT LINES FOR EIGHTS AND NINES

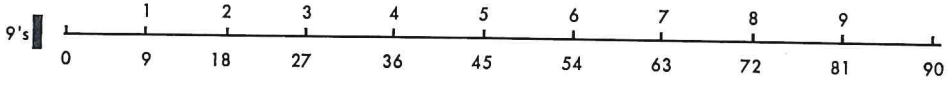


Say these quotients to yourself:

1. $8\overline{)40}$ $8\overline{)16}$ $8\overline{)64}$ $8\overline{)24}$ $8\overline{)56}$ $8\overline{)72}$ $8\overline{)48}$ $8\overline{)32}$

Copy these. Find each quotient and the remainder.

	a	b	c	d	e	f	g	h
2.	$8\overline{)19}$	$8\overline{)43}$	$8\overline{)26}$	$8\overline{)36}$	$8\overline{)51}$	$8\overline{)59}$	$8\overline{)76}$	$8\overline{)69}$
3.	$8\overline{)45}$	$8\overline{)29}$	$8\overline{)78}$	$8\overline{)39}$	$8\overline{)68}$	$8\overline{)31}$	$8\overline{)62}$	$8\overline{)53}$
4.	$8\overline{)27}$	$8\overline{)55}$	$8\overline{)60}$	$8\overline{)22}$	$8\overline{)79}$	$8\overline{)37}$	$8\overline{)47}$	$8\overline{)71}$
5.	$8\overline{)23}$	$8\overline{)52}$	$8\overline{)30}$	$8\overline{)44}$	$8\overline{)75}$	$8\overline{)67}$	$8\overline{)35}$	$8\overline{)63}$



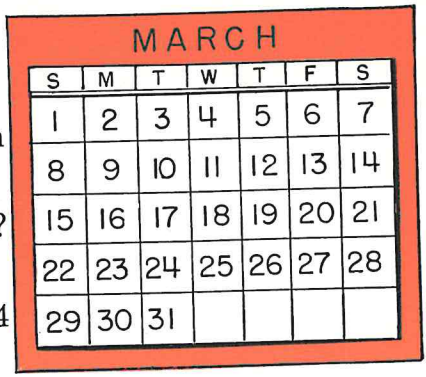
Say these quotients to yourself:

6. $9\overline{)18}$ $9\overline{)45}$ $9\overline{)81}$ $9\overline{)27}$ $9\overline{)54}$ $9\overline{)72}$ $9\overline{)36}$ $9\overline{)63}$

Copy these. Find the quotients and the remainders.

	a	b	c	d	e	f	g	h
7.	$9\overline{)20}$	$9\overline{)66}$	$9\overline{)29}$	$9\overline{)47}$	$9\overline{)39}$	$9\overline{)57}$	$9\overline{)80}$	$9\overline{)52}$
8.	$9\overline{)31}$	$9\overline{)26}$	$9\overline{)50}$	$9\overline{)71}$	$9\overline{)74}$	$9\overline{)44}$	$9\overline{)59}$	$9\overline{)84}$
9.	$9\overline{)23}$	$9\overline{)89}$	$9\overline{)35}$	$9\overline{)83}$	$9\overline{)42}$	$9\overline{)65}$	$9\overline{)79}$	$9\overline{)62}$
10.	$9\overline{)32}$	$9\overline{)25}$	$9\overline{)61}$	$9\overline{)40}$	$9\overline{)77}$	$9\overline{)49}$	$9\overline{)88}$	$9\overline{)68}$

HOW MANY OVER?



1. How many days are there in March?

2. How many weeks is that? How many days are left over?

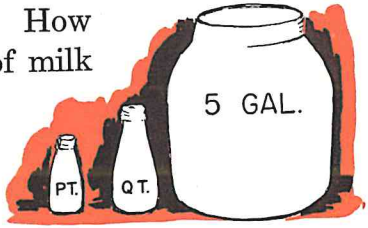
3. Does every month have 4 weeks?

4. Can any month have less than 4 Mondays, or 4 Wednesdays, or 4 Fridays?

5. Can any month have more than 5 Mondays?

6. A month of 30 days is 4 weeks and how many days?

7. How many pints are in a quart? How many quarts are in a gallon? A gallon of milk will fill how many pints?



8. A 5-gallon can of milk will fill how many pint bottles? How many half-pint bottles?

9. Will 20 gallons of milk from Mr. Burton's farm be enough for our school each day? Our school uses 150 pints each day. How many pints are in 20 gallons?

10. A ball team has 9 players on a side. Twenty-six children want to play. Will there be 2 teams? How many children will be left over?

$9\overline{)26}$

Thirty children will make how many teams? How many over?

N is a number.

a. N has 3 nines and 4 over. What is N?

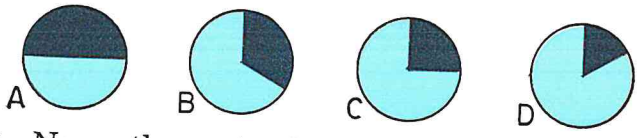
b. N has 4 sixes and 5 over. What is N?

c. N has 6 eights and 6 over. What is N?

d. N has 8 sevens and 5 over. What is N?

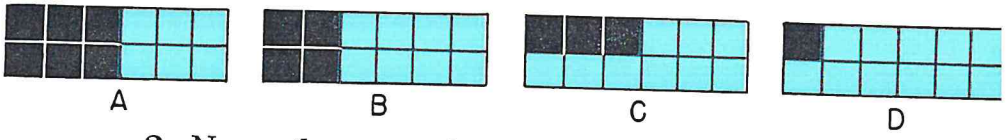
PARTS OF NUMBERS

We learned about parts of things before.



1. Name the parts above that are black.

Now we learn about parts of numbers.



2. Name the parts above that are black.

3. How many is $\frac{1}{2}$ of 12? $\frac{1}{3}$ of 12? $\frac{1}{4}$ of 12? $\frac{1}{6}$ of 12?

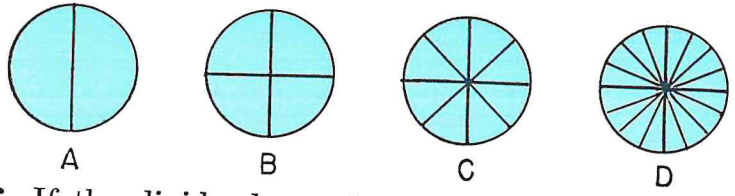
4. $2\overline{)12}\ 6$ $\quad 3\overline{)12}\ 4$ $\quad 4\overline{)12}\ 3$ $\quad 6\overline{)12}\ 2$

As the number of parts increases, what happens to the size of each part when the total group stays the same?

SMALLER (SIZ)

MORE (PARTS) | SAME

5. As the number of parts becomes greater, what happens to the size of the pieces?



6. If the dividend remains the same and the divisor increases, what happens to the quotient?

$1\overline{)8}\ 8$ $\quad 2\overline{)8}\ 4$ $\quad 4\overline{)8}\ 2$ $\quad 8\overline{)8}\ 1$

7. Which is larger: $\frac{1}{2}$ or $\frac{1}{6}$? $\frac{1}{3}$ or $\frac{1}{5}$? $\frac{1}{4}$ or $\frac{1}{2}$? $\frac{1}{4}$ or $\frac{1}{3}$? $\frac{1}{8}$ or $\frac{1}{4}$? $\frac{1}{5}$ or $\frac{1}{10}$? $\frac{1}{3}$ or $\frac{1}{2}$? $\frac{1}{5}$ or $\frac{1}{8}$? $\frac{1}{5}$ or $\frac{1}{6}$?

UNIT TEST

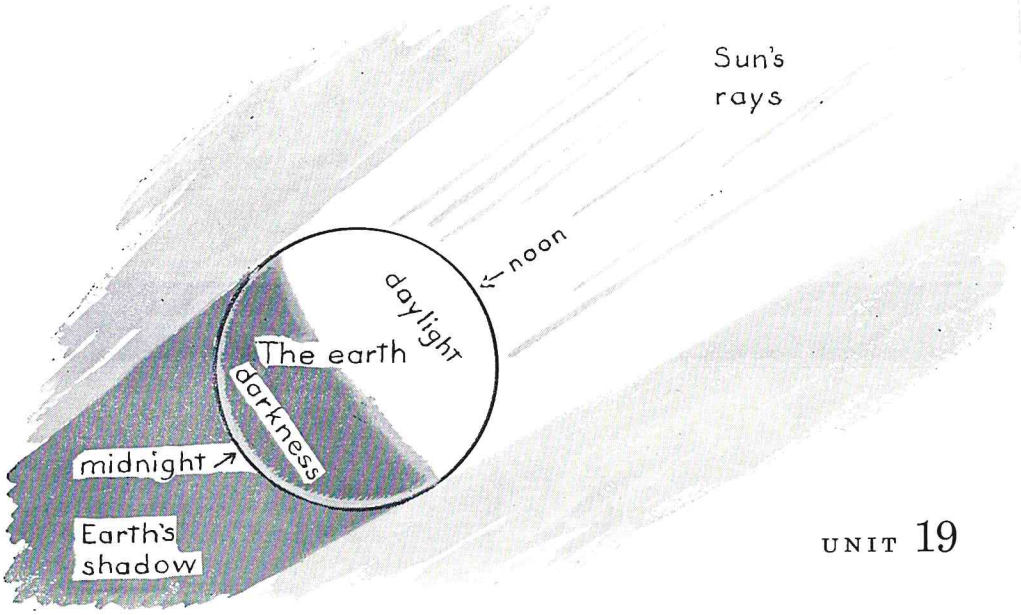
	a	b	c	d	e	f	g
1.	$2\overline{)19}$	$8\overline{)26}$	$6\overline{)37}$	$7\overline{)44}$	$4\overline{)39}$	$8\overline{)77}$	$9\overline{)57}$
2.	$7\overline{)68}$	$9\overline{)80}$	$6\overline{)53}$	$4\overline{)26}$	$7\overline{)39}$	$5\overline{)43}$	$3\overline{)20}$
3.	$4\overline{)31}$	$8\overline{)62}$	$7\overline{)53}$	$8\overline{)37}$	$9\overline{)52}$	$7\overline{)34}$	$9\overline{)33}$

4. Which numbers in the row below are even numbers?

2 9 6 17 18 12 21

GROWTH TEST

1. $9\overline{)720}$	**2.** Subtract 966 289	**3.** Add 379 978	**4.** 9×29
5. 853 -348	**6.** $28 + 474 + 8$	**7.** $400 \div 8$	**8.** $300 - 264$
9. Multiply 916 4	**10.** $8\overline{)568}$	**11.** 190 $\times 8$	**12.** Subtract 167 99
13. Add 29 34 68 69	**14.** $7\overline{)497}$	**15.** Multiply 157 9	**16.** Add 766 692 755
17. 7×806	**18.** $4\overline{)30}$	**19.** Subtract 214 145	**20.** Add 7 474 38 862



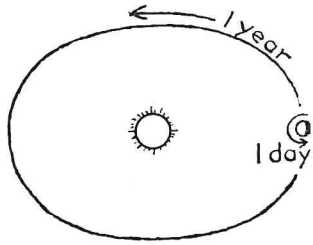
UNIT 19

TIME AND TEMPERATURE

EARTH AND SUN

Can you throw a basketball so that it whirls as it moves through the air? The earth moves like that. It moves a long, long way around the sun, and it whirls around once each day as it goes.

When the place where you live turns so that you can see the sunlight, it is daytime where you are. When the place where you live turns out of the sunlight, it is night where you are.



Have you ever tried to whirl as you run? You go two ways at once. The path of the earth looks like this drawing.

• The earth goes in a big path all the way around the sun. The time that it takes to go around the big path is called a **year.** The time it takes the earth to whirl around once is called a **day.**

THE SUN IS OUR TIMEKEEPER

When the sun appears to be about straight overhead, it is noon. Have you ever heard someone say, "at high noon"? This is when the earth has turned so that the sun seems to be highest.

On the other side of the earth, directly opposite, it is midnight. Have you ever heard someone say, "black as midnight"?

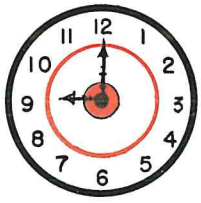
Each new day starts at midnight. The time from midnight till noon is called A.M. The time from noon till midnight is called P.M.

1. How many hours are there in a whole day?

2. Which of these times are morning? afternoon?

9 A.M. 2 P.M. 11 A.M. 7 A.M. 4 P.M. 3 P.M.

3. Can you tell by this clock whether it is morning or afternoon? Is it about 9 A.M. or 9 P.M.? Does the clock tell?



4. How many times does the big hand of a clock go clear around each 24-hour day? the small hand? How many times does each hand go around in half of a day?

5. Have you ever watched your shadow?

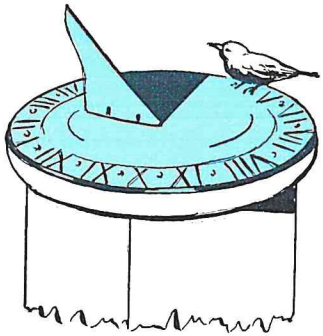
In what direction does it fall in the morning? at noon? in the afternoon?

Is your shadow longest early in the morning or near noon?

PRACTICE. Do Set 1 on page 217.

Why doesn't the clock strike 13?

Answer: It hasn't the face to do it.



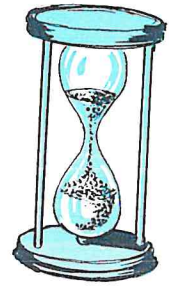
TELLING TIME—BY HOURS

1. The sundial was once used to tell time.

The shadow of a stick showed the time.

The stick was slanting so that it would tell time when the sun was high in the summer and low in the winter.

Would a sundial be good for telling time on cloudy days?

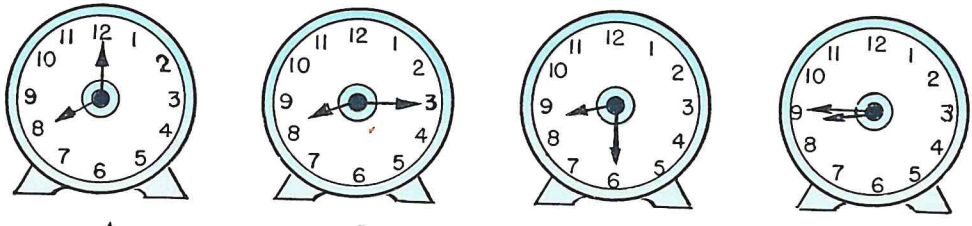


2. Before we had clocks, the hourglass was used indoors. It was often used to time cooking. It has two parts. Between the parts is a fine hole. When the glass is turned on one end, it takes one hour for the fine sand to run through the hole. You can buy a 3-minute glass now to use when boiling eggs.

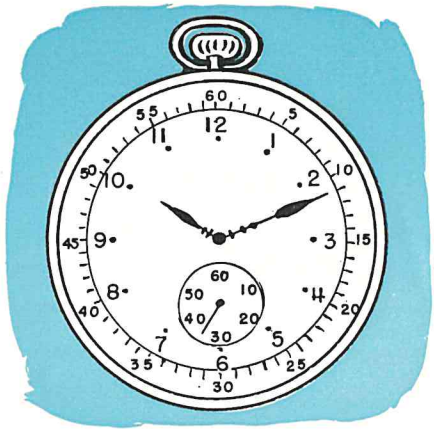
3. The clocks we have today are much easier to use than were sundials and hourglasses. Can you tell the time by the clocks below?

The hour hand of Clock *A* points at 8. The hour hand of *B* is past 8. For *C* it is halfway to 9. For *D* it is closer to 9 but is not yet there.

The minute hand of *A* is just ready to start on the hour between 8 o'clock and 9 o'clock. For *B* it is a quarter of the way around. For *C* it is halfway around. For *D* it still has a quarter of the way around to go before 9 o'clock.



TELLING TIME—BY MINUTES



Judy's grandfather has an interesting watch. Both hours and minutes are numbered on it. The long hand points to the minutes and the short hand points to the hours. The small hand at the bottom tells seconds.

On this watch the hour hand has just passed the hour of 10. The minute hand points to 11 minutes. The time is 11 minutes past ten o'clock.

1. How many minutes are there in an hour? Look at the number of minutes above the hour of 12. One quarter hour is 15 minutes. Half an hour is 30 minutes.

2. How many seconds are there in a minute?

3. When you write time, you write the hours first and then the minutes. Separate them with two dots (:).

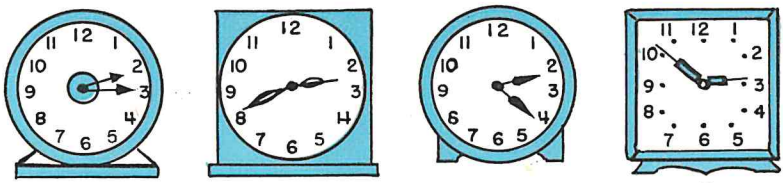
8:15 means the hour is 8, and that it is 15 minutes past 8.

8:30 means 30 minutes past 8.

4. Which clock on this page shows a quarter after two?

5. Which clock shows 2:15? 2:42? 2:52? 2:22?

6. Which clock shows 8 minutes of 3? How many minutes of 3 does Clock *C* show?



A B C D

PRACTICE. Do Set 2 on page 217.

PROGRAM TIMES

Radio

Can you read a radio program?

1. What can you hear on KXX at 9 o'clock Saturday morning?

2. At what time can you hear Peter Pan?

3. What else comes at the same time as the Nutcracker Suite?

4. When does the Mother Goose program end?

5. How long is Bible Stories?

6. Are these programs in the morning or afternoon?

Radio for Saturday

	9:00 A.M.
KXX	Mother Goose
KGG	Bible Stories
	9:15 A.M.
KXX	Mother Goose
KGG	Nutcracker Suite
	9:30 A.M.
KXX	Peter Pan
KGG	Robber's Cave

Television

The number at the right edge shows the station. We say, "Channel 2."

7. What is on Channel 6 at 1 o'clock?

8. What is on Channel 2 at 1:30?

9. What time can you see Dog Stories?

10. Baseball starts at what time?

11. How long is the Space Ships program?

12. Are these times in the morning or afternoon?

Television for Saturday Afternoon

1:00	Cowboys	2
	Boys' Band	6
1:30	Space Ships	2
	Magic	6
2:00	Dog Stories	2
	Baseball	6

School

13. How many recesses does Miss Jones' class have?

14. When does school begin after noon?

15. Say the lunch time another way.

16. How many hours is it from 9 to 3?

17. What happens at a quarter to twelve?

Miss Jones' Group

9:00	School Begins
10:15	Recess
11:45	Lunch
12:30	School Again
1:30	Recess
3:00	School Closes

PRACTICE. Do Set 3 on page 217.

PRACTICE

Set 1. Addition

1. 59 585 796	**2.** 776 87 458	**3.** 748 389 796	**4.** 639 687 879	**5.** 667 579 93

Subtraction

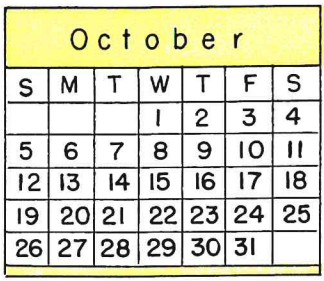
6. 789 436	**7.** 991 722	**8.** 872 283	**9.** 140 94	**10.** 756 687
11. 563 468	**12.** 804 736	**13.** 1647 759	**14.** 1563 984	**15.** 716 639

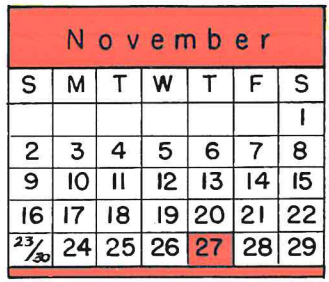
Set 2. Multiplication

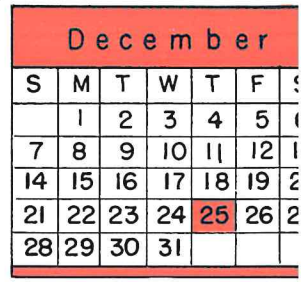
1. 597 2	**2.** 836 4	**3.** 586 7	**4.** 758 3	**5.** 736 5
6. 964 3	**7.** 749 6	**8.** 758 9	**9.** 975 4	**10.** 635 8
11. 835 6	**12.** 479 8	**13.** 948 5	**14.** 749 7	**15.** 364 9

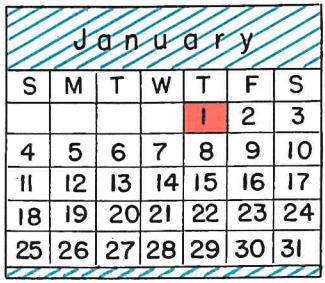
Set 3. Division

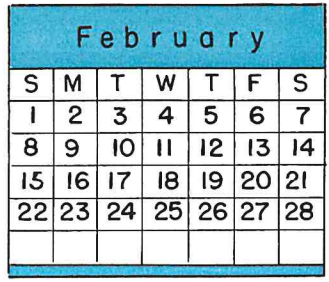
1. $2\overline{)146}$	**2.** $5\overline{)305}$	**3.** $3\overline{)249}$	**4.** $6\overline{)360}$
5. $4\overline{)328}$	**6.** $9\overline{)270}$	**7.** $7\overline{)217}$	**8.** $5\overline{)355}$
9. $8\overline{)43}$	**10.** $3\overline{)186}$	**11.** $5\overline{)47}$	**12.** $2\overline{)188}$
13. $4\overline{)29}$	**14.** $9\overline{)65}$	**15.** $7\overline{)53}$	**16.** $6\overline{)47}$
17. $8\overline{)79}$	**18.** $6\overline{)29}$	**19.** $9\overline{)41}$	**20.** $7\overline{)32}$

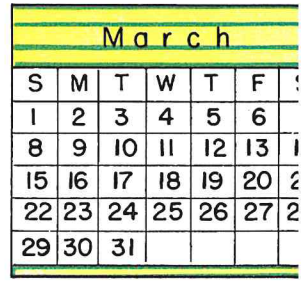












CAN YOU READ A CALENDAR?

1. How many days are there in October? November? December?

2. On what day of the week does New Year's Day come on this calendar? Does it always come on the same day of the week? You can tell from calendars for other years.

3. Can you name the holidays shown on the calendar?

4. Are there holidays in February in your school?

5. On what day of the week does Thanksgiving come? Does it always come on Thursday? Does it always come on November 27?

6. On what day of the week does Christmas come on this calendar? Does it always come on Thursday? Does it always come on December 25?

7. On this calendar what day of the week is October 15? March 7?

8. How many months are there in a year? Write the names of the months.

THE CALENDAR COUNTS THE DAYS

Every day, all day, the earth turns and turns. The time of one complete turn of the earth is divided into 24 hours.

Each hour has 60 minutes.

Each minute has 60 seconds.

The earth goes around and around the sun. It never stops. The time it takes to go around the sun is called a year.

It takes the earth a little more than 365 days to go all the way around the sun.

So most years have 365 days. About every fourth year is a leap year to catch up. A leap year is 366 days.

The months are not all the same length. The years are not all the same length. But the weeks, the days, the hours, and the minutes always stay the same.

Days

1 day = time it takes for earth to turn on its axis
1 day = 24 hours
1 hour = 60 minutes
1 minute = 60 seconds

Clocks time the days.

Years

1 year = time it takes for earth to go around the sun
1 year = 365 days
1 leap year = 366 days
1 year = 12 months
1 month = 31 days, or 30 days, or 28 or 29 days
1 month = 4 weeks, with some days left over
1 week = 7 days

Calendars time the years.

1. How many days are there in 4 weeks? in two weeks?
2. How many minutes are two hours?
3. How many minutes is a half hour? a quarter hour?
4. A leap year divides evenly by 4. Is this a leap year?
5. Try to estimate the length of a minute.

PRACTICE. Do Set 1 on page 223.

Bring a thermometer to class tomorrow.

THE SUN MAKES THE TEMPERATURE

The earth is warmed by the sun. The *temperature* of the air tells how warm or how cold it is.

1. Why are nights colder than days? Why is it cooler in the shade than in the sun? Are things really in the shade at night?

2. How do we tell how warm it is?

3. Rulers measure distance. Scales measure weight. Clocks measure time. What measures temperature?

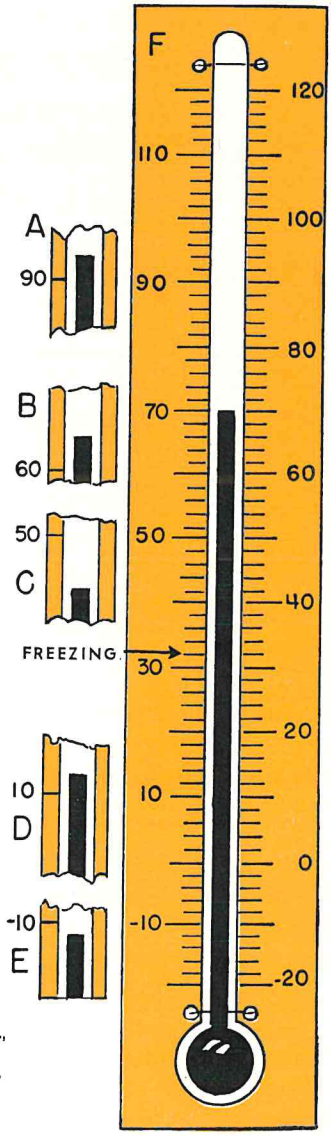
4. As most things get warm, they become bigger. This fact makes a thermometer possible. A football becomes tighter when the air in it gets warmer. Railway rails become a little longer. Steel bridges are made with rollers so they can become a little longer when it is warmer. Liquids also become a little larger.

One kind of a thermometer is made with a liquid in a bulb. A very thin tube runs up from the top of the bulb. The liquid in the tube has no place to go but upward when it gets warmer. Marks are placed at the side of the tube.

The mark at the height of the liquid measures how warm or cold it is.

THERMOMETERS AND DEGREES

Thermometers tell how warm or how cold things are. Weather thermometers tell the temperature of the air. Thermometers are also made to tell the temperature of the body. There are thermometers for use in cooking and for many other uses.



1. Can you read a thermometer? This one is a weather thermometer.

The big thermometer shows a good temperature for a classroom. What does it read? The distance between two small lines is 2 degrees.

Can you count by twos? "70, 72."

2. We measure distances in inches and feet. Weight is measured in pounds and ounces. Temperature is measured in degrees. The sign for degrees is (°). 72° is read "seventy-two degrees."

3. Read the temperatures in *A*, *B*, *C*, *D*, and *E*. Look for the tens' mark and add 2 for each space. Be careful when reading *E*.

4. At what temperature on this thermometer does water freeze?

5. A day that is 100° is a hot day. Do you think you would need a coat for a day of 50°? 70°? 90°?

PRACTICE. Do Set 2 on page 223.

Bring a weather report tomorrow. Cut it from a newspaper.

This weather report gives the highest and lowest temperatures for one day in March.

The Weather

High and low temperatures for one day

	HIGH	LOW
Atlanta	66	45
Boston	53	41
Chicago	51	31
Cleveland	40	34
Denver	66	30
Detroit	38	35
Ft. Worth	65	50
Indianapolis	54	34
Kansas City	68	34
Los Angeles	70	47
Miami	83	72
New Orleans	74	54
New York	57	50
Pittsburgh	40	37
San Francisco	61	44
Seattle	47	42

1. Which city was warmest?

2. Which city was coldest?

3. What was the difference between the high and low temperatures in Chicago? in New York?

4. How many degrees would the height of the liquid in a thermometer move in Boston on this day?

5. How many degrees warmer was Miami than Pittsburgh? Kansas City than Boston?

6. How many degrees colder did it get at Denver than Los Angeles? at Detroit than Atlanta?

7. Is 32° above zero freezing? Look at the thermometer on page 221.

8. In how many of these cities did the temperature go below freezing?

9. Did you find a weather report in a newspaper? Read some information from it. Make some problems about it.

10. Why would a weather thermometer with a liquid break if put into a hot oven?

11. Early in the morning it was 10° below zero. At noon it was 20° above zero. How many degrees warmer was it at noon?

PRACTICE

Set 1. Addition

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
467	609	408	38	406	607	402	783
38	704	729	605	859	394	607	329

(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
375	874	87	65	67	345	176	43
39	85	92	173	999	24	768	386
406	63	265	534	55	968	89	798

(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
589	38	553	449	59	436	868	757
476	77	628	494	87	573	55	549
838	6	72	37	567	553	304	808
97	3	95	60	306	240	25	86

Set 2. Subtraction

(1)	(2)	(3)	(4)	(5)	(6)
784	794	967	668	576	790
253	420	15	626	36	750

(7)	(8)	(9)	(10)	(11)	(12)
971	842	572	657	945	434
648	335	53	618	37	405

Set 3. Subtraction

(1)	(2)	(3)	(4)	(5)	(6)	(7)
458	835	738	527	647	309	105
292	690	667	473	90	234	76

(8)	(9)	(10)	(11)	(12)	(13)	(14)
653	360	573	747	240	416	104
468	84	94	659	73	367	78

UNIT 20

PROBLEM SOLVING

MAKING PROBLEMS

A problem must have two parts. One part is a question, or it can be made into a question. The other part tells you something about the problem.

1. John has a problem. He wants a baseball suit. He has only $5.50. Say the problem for the class.

2. John's problem would be different if he wanted the catcher's mitt. Say this problem.

3. Suppose John wants both the catcher's mitt and the suit. Make up a problem about that.

4. Make a problem about the ball and the mitt.

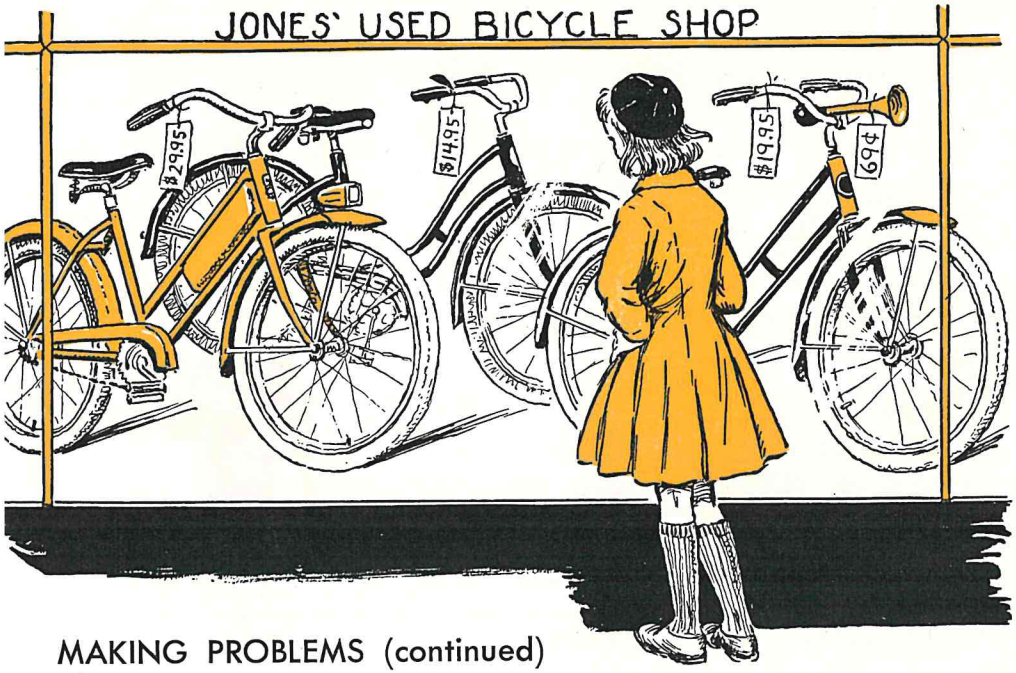
5. Make a problem about all the things in the window.

6. Make a problem about something you want.

7. Make a problem about something you are making.

8. Can you make up problems about time? about weight? about size? about distance?

9. Make some problems of your own about money.



MAKING PROBLEMS (continued)

1. Mary's grandmother gave her $20 for her birthday. Mary wants a bicycle. What might Mary's problem be?

2. Make a problem about one of the bicycles and a new tire which costs $3.00.

3. Make a problem about a bicycle, a horn, and a tire.

4. Make a problem about two of the bicycles.

5. Can you make a problem about one of these used bicycles and a new bicycle?

6. Can you make a problem about a girl who wants to buy something else? Suppose she has more money than it costs.

7. Make a problem about a girl who wants to know what two things will cost.

8. Can you make a problem about a girl or a boy who does not have enough money to buy something he or she wants?

PRACTICE. Do Set 1 on page 227.

HOW TO READ A PROBLEM

What does the problem **ask?**
What does it **tell?**
What do you **do?**

In some of these, one part is missing:

1. How many pounds has Tom gained? He weighed 59 lb. in September. He weighs 64 lb. now.

2. How many pounds heavier is Sarah now? She weighs 61 lb. She weighed 57 lb. in September.

3. Tony weighs 63 lb. now. He weighed 58 lb. in September. How many pounds lighter was he in September?

4. How much has Jean lost or gained? She now weighs 63 lb. She weighed 59 lb. in September.

5. Bill gained most of all. He now weighs 72 lb. He gained 8 lb. You ask a question to finish this problem.

6. Fred and Bob are a tie for heaviest boy in the room. Each weighs 74 lb. Jim weighs 73 lb. Ask a question that will make a problem.

7. Sally weighed 59 lb. in September. The nurse says she has gained 6 lb. since then. Can you tell how heavy Sally is now? If so, how?

8. Joe weighs 67 lb. now. He says he will gain 3 more pounds by June. How much will he weigh then?

9. What month is it now? How many months ago was September? How can you find out?

PRACTICE. Do Set 2 on page 227.

YOU ASK A QUESTION

Ask a question to make each of these a problem. Then answer each problem.

1. Henry weighed 64 lb. in September. Now he weighs 70 lb.

2. Peggy weighs 72 lb. now. She weighed 65 lb. in September.

3. Jerry weighs 66 lb. Ben weighs 69 lb.

4. The heaviest boy weighs 74 lb. The heaviest girl weighs 72 lb.

5. Pete lost 3 lb. He weighs only 63 lb. now.

6. Ruth weighed 63 lb. in September. She gained 5 lb.

7. George gained 3 lb. Ben gained 7 lb.

8. Betty lost 2 lb. Sue lost 1 lb.

PRACTICE

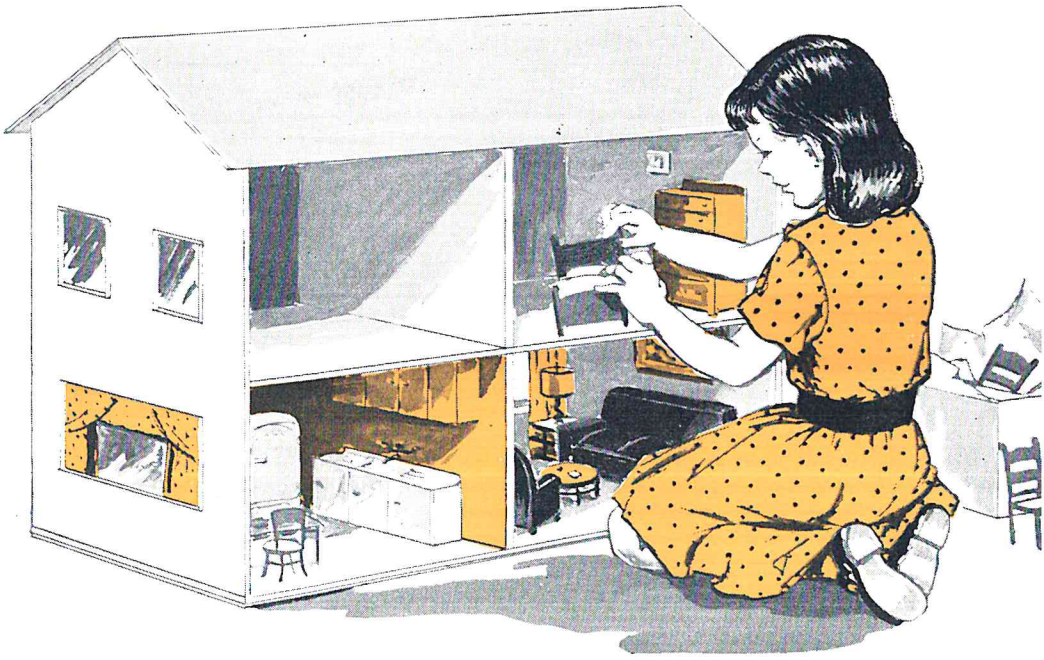
Use folded paper.

Set 1

	a	b	c	d	e	f	g	h
1.	$5\overline{)10}$	$7\overline{)21}$	$5\overline{)20}$	$9\overline{)81}$	$5\overline{)15}$	$3\overline{)12}$	$5\overline{)25}$	$6\overline{)18}$
2.	$6\overline{)30}$	$4\overline{)12}$	$9\overline{)72}$	$6\overline{)24}$	$3\overline{)21}$	$4\overline{)20}$	$9\overline{)27}$	$5\overline{)35}$
3.	$8\overline{)32}$	$4\overline{)16}$	$8\overline{)24}$	$3\overline{)18}$	$9\overline{)45}$	$6\overline{)36}$	$7\overline{)28}$	$6\overline{)48}$

Set 2

	a	b	c	d	e	f	g	h
1.	$4\overline{)24}$	$8\overline{)72}$	$3\overline{)24}$	$5\overline{)40}$	$9\overline{)36}$	$5\overline{)30}$	$8\overline{)56}$	$7\overline{)49}$
2.	$3\overline{)27}$	$9\overline{)54}$	$8\overline{)40}$	$9\overline{)63}$	$8\overline{)64}$	$5\overline{)45}$	$6\overline{)42}$	$7\overline{)63}$
3.	$7\overline{)35}$	$8\overline{)48}$	$4\overline{)28}$	$6\overline{)54}$	$7\overline{)42}$	$4\overline{)36}$	$7\overline{)56}$	$4\overline{)32}$



WHAT ELSE DO YOU NEED TO KNOW?

Not enough facts are given in some of these problems for you to get the answers. Can you tell what else is needed?

1. Peggy bought a new doll house. She saved $2 to pay for it. Her mother gave her $6. How much money did Peggy have left?

2. Peggy has three friends who are helping her make curtains for the doll house. One-half yard of cloth will be enough. What will a half yard cost?

3. Peggy's mother says it will take 3 hours to make the curtains. What time will it be when they finish the curtains?

4. Six small plates cost 5¢ each. How much will all six plates cost?

5. There will be a table and four chairs in the room in the doll house which is still empty. What will the chairs for the room cost all together?

WHAT FACTS ARE MISSING?

Give the answers for problems that have all the facts needed. Tell what you need to know in the others.

1. How far is it from Rock City to Far View?

2. Which town is farthest from Far View?

3. Which two towns are farthest apart?

4. How far is it from Park to Far View?

5. What is the farthest distance shown from one town to the next town?

6. How far is it between the two towns that are nearest each other?

7. Which town has the most people?

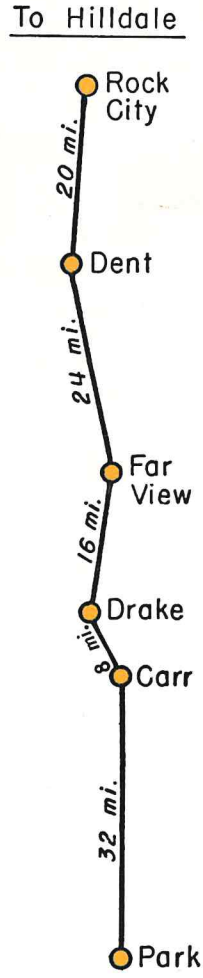
8. Which towns are 40 miles apart?

9. How far is it from Dent to Hilldale?

10. If Mr. Wilson drives 32 miles in one hour, how long will it take for him to go from Carr to Park?

11. How long will it take Mr. Black to go from Drake to Far View? Can you tell? What do you need to know?

12. How far is a round trip between Drake and Rock City?



What is the difference between any distance one way and the round trip for the same distance?

REASONABLE ANSWERS

1. Jack bought 10 Valentine cards for 15¢ each. He gave the clerk a dollar. Was that reasonable? What do you think the clerk thought?

2. Betty had a dollar to spend for 8 Valentine cards. The cost for one kind was 25¢ each. Another kind cost 15¢ each. Others were 10¢ each. She decided to buy the 25-cent cards. Was that reasonable?

3. "Let's buy a 10-cent card for every member in our room," said Betty. "That would take $10," said Jack. Is that reasonable?

4. Some cards cost a dime each. Some cost a quarter each. "A quarter is more than twice a dime," said Jack. "Let's buy the cards that cost a quarter each and get twice as many for our money." Is that reasonable?

5. Betty says she can buy twice as many 10-cent cards as she can 25-cent cards with her money. Is that reasonable?

Our car went a half mile in a minute. "There are two halves in a minute," thought Dick. "That is 120 miles an hour," he said. Is Dick's estimate reasonable? Will drawing a picture help you think about this problem?

WHAT DO YOU DO?

Tell just what you would do to get the answers:

1. How many more paper plates will Barbara need? She needs 28 paper plates all together for the class party. She has 12 plates now.

2. Twenty-four children in your room want to receive a weekly newspaper. You have written to see what it will cost for each. How much money will be sent for all 24 children?

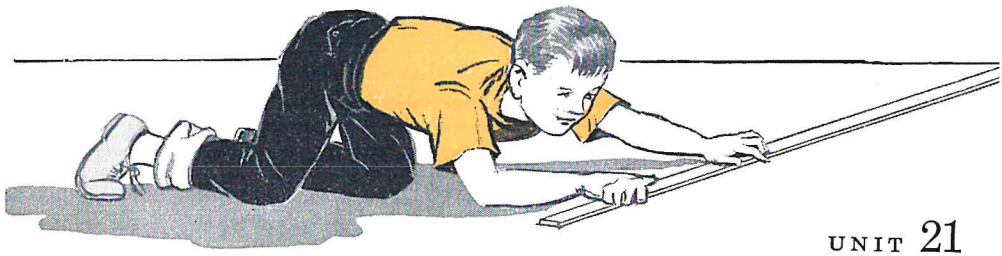
3. How long have you been away from home? You left at 9:30 A.M. It is now 2:30 P.M.

4. How many cars will be needed to take the children to the picnic? You know how many will ride in each car.

TESTING YOURSELF

Use an answer strip.

(1)	(11)	(1)	(11)	(1)	(11)
8 × 9	8 × 8	9's in 81	6's in 48	4's in 16	7's in 49
5 × 6	4 × 7	3's in 12	5's in 40	8's in 72	4's in 36
4 × 4	7 × 9	6's in 24	9's in 36	6's in 36	8's in 48
7 × 7	4 × 9	4's in 20	8's in 24	3's in 24	7's in 63
8 × 5	7 × 6	9's in 27	9's in 54	8's in 40	6's in 54
(6)	(16)	(6)	(16)	(6)	(16)
6 × 6	5 × 9	3's in 18	5's in 30	4's in 24	8's in 56
3 × 8	4 × 8	9's in 72	9's in 63	5's in 45	4's in 32
4 × 6	8 × 6	7's in 28	7's in 35	3's in 27	7's in 42
7 × 5	7 × 8	8's in 32	6's in 42	4's in 28	6's in 18
3 × 9	6 × 9	9's in 45	7's in 56	8's in 64	5's in 35



UNIT 21

REMAINDERS IN DIVISION

▶ DIVIDING IS LIKE SUBTRACTING

Carolyn's figures

25
−3
22
−3
19
−3
16
−3
13
−3
10
−3
7
−3
4
−3
1

1. The children in fourth grade are planning a mural. Their room is 25 feet wide. How many yards of paper will they need?

a. Jim is measuring carefully with a yardstick. How many times will he lay it down?

b. Carolyn knows that 1 yard equals 3 feet. She is finding the answer by subtracting threes.

How many times does she take 3 away? Count the check marks to see.

Is there one foot left over?

A short way to measure 25 feet by yards is to use division.

How many threes are there in 25? → $3\overline{)25}$ → $\begin{array}{r}8\\3\overline{)25}\end{array}$

Are there 8? → $3\overline{)25}$

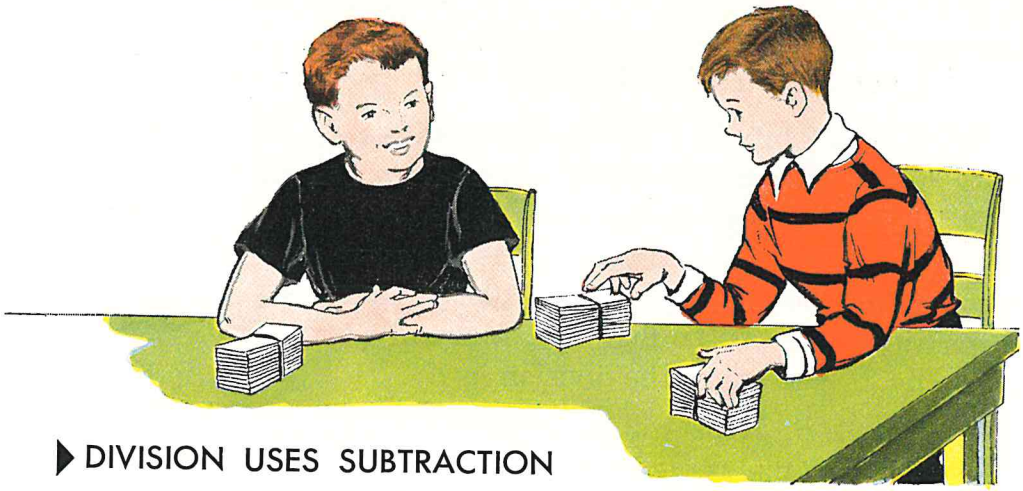
$8 \times 3 = 24$ → $\begin{array}{r}8\\3\overline{)25}\\24\\\hline 1\end{array}$

You can take 8 threes from 25 all at once, instead of subtracting 8 times as Carolyn did.

2. Find how many yards in each example below. Are there any feet left over?

a. $3\overline{)19}$ ft. **b.** $3\overline{)24}$ ft. **c.** $3\overline{)28}$ ft. **d.** $3\overline{)21}$ ft. **e.** $3\overline{)15}$ ft.

f. $3\overline{)11}$ ft. **g.** $3\overline{)26}$ ft. **h.** $3\overline{)22}$ ft. **i.** $3\overline{)21}$ ft. **j.** $3\overline{)16}$ ft.



DIVISION USES SUBTRACTION

Bob has 30 tickets to share equally with Bill. How many tickets will each boy have?

1. How many is $\frac{1}{2}$ of 30?

2. Thirty is 3 tens. Divide 3 tens by 2. One ten for each boy takes 2 tens. → Is there 1 bundle of 10 left over? →

A

1 ten	1
2)3 tens	2)30
2 tens	2
1 ten	1

How can the boys divide the remaining 10 tickets?

What is $\frac{1}{2}$ of 10?

Are there any left?

Can 2 boys have 15 tickets apiece?

B

15
2)30
2
10
10

3. What is the remainder in the tens' place in each of these examples? The first one is done for you.

Remainder in tens' place →

2
2)50
4
1

a. $2\overline{)50}$ **b.** $5\overline{)70}$ **c.** $4\overline{)60}$ **d.** $2\overline{)90}$ **e.** $6\overline{)90}$

f. $5\overline{)90}$ **g.** $2\overline{)70}$ **h.** $5\overline{)80}$ **i.** $2\overline{)30}$ **j.** $5\overline{)60}$

4. Why must the digit of the remainder in each example above be smaller than the divisor?

ZERO IN ONES' PLACE

1. "How much will three ice-cream sodas cost?" asked Jane. "60 cents," said the clerk. How much is that for each soda?

6 dimes ÷ 3 = ?. Are any cents left over? You write zero in the quotient so that the 2 will stand for dimes.

$$3\overline{)60¢}\quad 20¢$$

2. Divide 150 into 5 equal groups. 150 is 15 tens. 15 ÷ 5 is ?. Why must zero be written in the quotient?

$$5\overline{)150}\quad 30$$

3. Divide 240 into two equal groups.

240 = ? hundreds, ? tens, and ? ones.

2 hundreds ÷ 2 = ?. Where is the 1 written?

There are 4 left in tens' place. What is 4 tens ÷ 2?

Are there any ones? Why must you be sure to put a zero in ones' place in the quotient?

$$2\overline{)240}\quad 120$$

$$\begin{array}{r} 2 \\ \hline 4 \\ 4 \\ \hline 0 \end{array}$$

● When you divide, be sure to use zeros in the answers when they are needed.

$$3\overline{)81}\quad 27$$

$$\begin{array}{r} 6 \\ \hline 21 \\ 21 \\ \hline \end{array}$$

PRACTICE

	a	b	c	d	e	f	g	h
1.	$3\overline{)90}$	$2\overline{)40}$	$4\overline{)80}$	$2\overline{)60}$	$4\overline{)40}$	$3\overline{)60}$	$2\overline{)80}$	$3\overline{)30}$
2.	$5\overline{)250}$	$6\overline{)240}$	$3\overline{)180}$	$7\overline{)210}$	$8\overline{)320}$	$9\overline{)270}$	$4\overline{)280}$	$8\overline{)240}$
3.	$3\overline{)690}$	$2\overline{)260}$	$3\overline{)960}$	$4\overline{)840}$	$2\overline{)260}$	$3\overline{)360}$	$4\overline{)480}$	$2\overline{)460}$
4.	$4\overline{)240}$	$3\overline{)630}$	$7\overline{)280}$	$5\overline{)350}$	$2\overline{)840}$	$6\overline{)300}$	$4\overline{)320}$	$3\overline{)390}$

$2\overline{)74}$

$$C.\ 2\overline{)74}\quad \begin{array}{r} 37 \\ \hline 6\downarrow \\ 14 \\ 14 \\ \hline \end{array}$$

the

f. $4\overline{)92}$

l. $3\overline{)72}$

DIVIDING DOLLARS AND CENTS

1. The class has \$4.86 for its party. How much will each of two committees get? Is the answer money? If it is, you must write the signs to show money. Where is the dollar sign written? the point?

$$2\overline{)\$4.86}\quad \$2.43$$

2. Three children share \$6.00 equally. How much is each one's share?

3. Joe earns \$6.25 in 5 days. How much is the average for each day? Explain the division.

$$5\overline{)\$6.25}\quad \$1.25$$

$$\begin{array}{r} 5 \\ \hline 12 \\ 10 \\ \hline 25 \\ 25 \\ \hline \end{array}$$

4. Mary's grandmother gave her \$2.25 to buy dresses for her 3 dolls. If she divides the money equally, how much will she have for each doll?

$$\begin{array}{r} \$\ .7 \\ 3\overline{)\$2.25} \\ 21 \\ \hline 15 \end{array}$$

This time there are not enough dollars to divide by 3. So think 22 dimes. Are there 7 threes in 22? Why is the 7 in the dimes' column? Is there 1 dime left over?

Tell how the division is finished.

5. Jack is paying \$1.44 for 6 hamburgers. How much does each one cost?

6. Jean and her twin sister are buying dresses which are alike. The cost of both is \$10.50. What is the cost of each? Explain the division.

$$2\overline{)\$10.50}\quad \$\ 5.25$$

$$\begin{array}{r} 10 \\ \hline 5 \\ 4 \\ \hline 10 \\ 10 \\ \hline \end{array}$$

7. Three tickets for the movie cost \$1.98. What is the price of each ticket?

8. Six quarts of ice cream cost \$3.90. How much does a quart of it cost?

Copy these and divide:

9. $3\overline{)\$4.02}$ **10.** $5\overline{)\$1.75}$ **11.** $6\overline{)\$14.58}$ **12.** $3\overline{)\$18.87}$

REMAINDERS IN ONES' AND TENS' PLACES

1. Fourteen people are to be seated at tables. There are 4 places at each table. What happens?

How many 4's are there in 14? How many are left?

How many tables will be filled? How many will be seated at the fourth table?

$$4\overline{)14}\quad 12\quad 2$$

2. There are 25 children for two sides for a game. How many will there be on each side?

25 is 2 tens and 5 ones. $\frac{1}{2}$ of 2 tens = _?_.

What do you subtract? Are any tens left? Does each side now have ten children?

5 children are still to be divided for the two sides. $5 \div 2 =$ _?_. What do you subtract from 5?

Each side now has how many? What shall be done with the child left over?

$$2\overline{)25}\quad 2\quad 5\quad 4\quad 1$$

3. Mr. Brown has 123 chickens. He wants to sell just half of them. Can he?

How many tens are there in 123? $\frac{1}{2}$ of 12 tens = _?_. 6 tens $\times$ 2 = 12 tens. Taking out 12 tens leaves 3 ones.

$3 \div 2 =$ _?_. What do you subtract from 3? Why?

Mr. Brown has how many groups of 61 each? Is there 1 chicken left over?

$$2\overline{)123}\quad 12\quad 3\quad 2\quad 1$$

4. How would you divide 33 people into 2 groups? How many will be in each group? How many left over?

5. Copy these and divide.

a. $3\overline{)53}$ **b.** $2\overline{)159}$ **c.** $3\overline{)100}$ **d.** $5\overline{)87}$ **e.** $4\overline{)298}$ **f.** $9\overline{)820}$

DIVIDING INTO GROUPS

Every month Miss Brown's room has a party for all children who have birthdays that month. This is the month for the birthdays of Tony, Helen, and Dick.

1. There will be 31 children at the party. Is there any way to divide 31 into equal groups for games?

2. Divide 31 into 3 groups. How many will there be in each of the 3 groups if you divide them as evenly as you can?

3. How many will there be on a side for games if there are two sides? Can the sides be even?

4. How many groups of 4 each could there be for table games?

5. The tables are placed so that there can be 8 children in each group. How many groups of 8 will there be? How many children will be in the group that is left? How could it become a group of 8?

6. Divide 31 by 2; by 3; by 4; by 5; by 6; by 7; by 8; by 9.

• Some numbers can be divided evenly only by themselves and 1.

ZEROS IN THE QUOTIENT

1. You know how to do this example. 4 tens divided by 2 is how many tens? 2 tens are _?_.

$$\begin{array}{r} 20 \\ 2\overline{)40} \end{array}$$

2. You know how to do this example. 4 hundreds divided by 2 is how many hundreds? $400 \div 2 = \_?\_$.

$$\begin{array}{r} 200 \\ 2\overline{)400} \end{array}$$

3. This division is new. Read about it below:

$$\begin{array}{r} 2 \\ 2\overline{)406} \end{array}$$

a. Divide 4 by 2. Where is the answer written? Why?

$$\begin{array}{r} 20 \\ 2\overline{)406} \end{array}$$

b. Are there any tens in tens' place? What is written in tens' place to show no tens?

$$\begin{array}{r} 203 \\ 2\overline{)406} \end{array}$$

c. How many twos are there in 6? Where is the answer written? Why? 406 divided by 2 is how many?

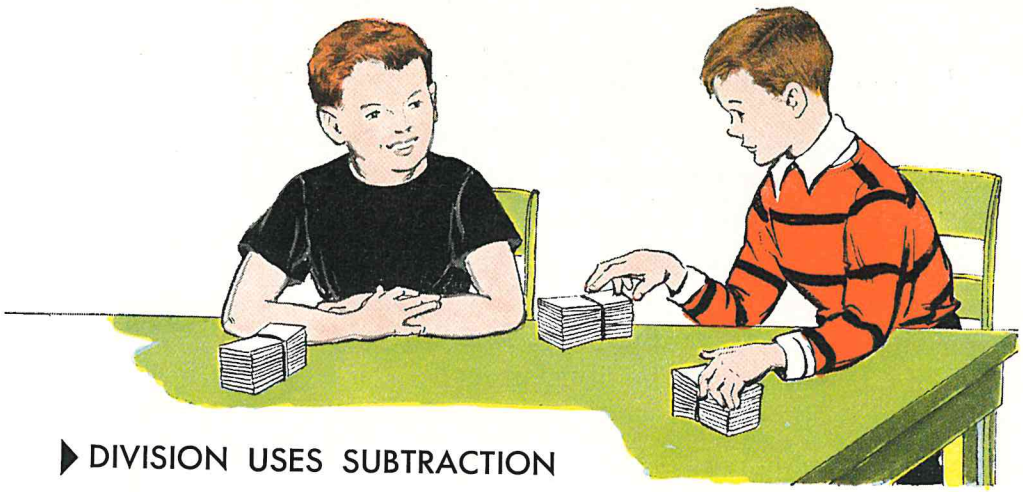
4. Tell what happens as you divide 612 by 3.

a	b	c	d
$\begin{array}{r} 2 \\ 3\overline{)612} \\ \underline{6} \end{array}$	$\begin{array}{r} 20 \\ 3\overline{)612} \\ \underline{6} \\ 1 \end{array}$	$\begin{array}{r} 20 \\ 3\overline{)612} \\ \underline{6} \\ 12 \end{array}$	$\begin{array}{r} 204 \\ 3\overline{)612} \\ \underline{6} \\ 12 \\ \underline{12} \end{array}$

5. Tell what happens as you divide 483 by 4.

a	b	c	d
$\begin{array}{r} 1 \\ 4\overline{)483} \\ \underline{4} \end{array}$	$\begin{array}{r} 12 \\ 4\overline{)483} \\ \underline{4} \\ 8 \\ \underline{8} \end{array}$	$\begin{array}{r} 12 \\ 4\overline{)483} \\ \underline{4} \\ 8 \\ \underline{8} \\ 3 \end{array}$	$\begin{array}{r} 120 \\ 4\overline{)483} \\ \underline{4} \\ 8 \\ \underline{8} \\ 3 \end{array}$

6. $3\overline{)906}$ **7.** $4\overline{)816}$ **8.** $3\overline{)619}$ **9.** $2\overline{)421}$ **10.** $5\overline{)702}$



DIVISION USES SUBTRACTION

Bob has 30 tickets to share equally with Bill. How many tickets will each boy have?

1. How many is $\frac{1}{2}$ of 30?

2. Thirty is 3 tens. Divide 3 tens by 2. One ten for each boy takes 2 tens. → Is there 1 bundle of 10 left over? →

A

1 ten	1
2)3 tens	2)30
2 tens	2
1 ten	1

How can the boys divide the remaining 10 tickets?

What is $\frac{1}{2}$ of 10?

Are there any left?

Can 2 boys have 15 tickets apiece?

B

15
2)30
2
10
10

3. What is the remainder in the tens' place in each of these examples? The first one is done for you.

2
2)50
4
1

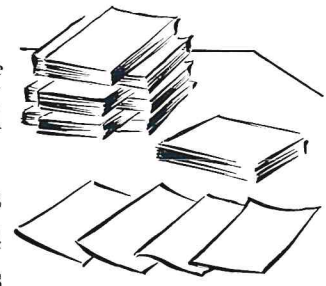
Remainder in tens' place →

a. $2\overline{)50}$ **b.** $5\overline{)70}$ **c.** $4\overline{)60}$ **d.** $2\overline{)90}$ **e.** $6\overline{)90}$

f. $5\overline{)90}$ **g.** $2\overline{)70}$ **h.** $5\overline{)80}$ **i.** $2\overline{)30}$ **j.** $5\overline{)60}$

4. Why must the digit of the remainder in each example above be smaller than the divisor?

REMAINDERS IN TENS' PLACE



1. Mary says there are 74 sheets of paper to last the class 2 days. How will she find half of 74 sheets?

Mary groups the sheets as she counts them. She makes 7 piles of 10 each and 4 single sheets. To find half, Mary divides by 2. She writes the division in *A*. → *A*. $2\overline{)74}$

In *B*, 7 tens ÷ 2 is 3 tens. $3 \times 2 = 6$. Subtract 6 tens. Is there 1 ten left? →

$$B.\ \begin{array}{r} 3 \\ 2\overline{)74} \\ \underline{6\downarrow} \\ 14 \end{array}$$

Mary writes the 4 down beside the 1 to make a new dividend. →

In *C*, what is half of 14? $7 \times 2 = 14$. Subtract 14 from 14. Is there a remainder? →

$$C.\ \begin{array}{r} 37 \\ 2\overline{)74} \\ \underline{6\downarrow} \\ 14 \\ \underline{14} \end{array}$$

Mary says $\frac{1}{2}$ of 74 is 37.

2. Did Mary subtract twice in dividing 74 by 2?

When you divide a number, you divide the tens before the ones. Then you subtract what you have divided. Bring down the ones. Next you divide the number that is left.

3. Tell how each example is divided:

a.
$$\begin{array}{r} 16 \\ 2\overline{)32} \\ \underline{2} \\ 12 \\ \underline{12} \end{array}$$

b.
$$\begin{array}{r} 24 \\ 4\overline{)96} \\ \underline{8} \\ 16 \\ \underline{16} \end{array}$$

c.
$$\begin{array}{r} 27 \\ 3\overline{)81} \\ \underline{6} \\ 21 \\ \underline{21} \end{array}$$

PRACTICE

Copy and divide:

a. $3\overline{)78}$ **b.** $2\overline{)90}$ **c.** $4\overline{)56}$ **d.** $3\overline{)42}$ **e.** $2\overline{)78}$ **f.** $4\overline{)92}$

g. $2\overline{)36}$ **h.** $3\overline{)54}$ **i.** $5\overline{)60}$ **j.** $4\overline{)72}$ **k.** $5\overline{)85}$ **l.** $3\overline{)72}$

REMAINDERS IN TENS' PLACE (continued)

1. How many will be on a side if you divide 32 children into 2 equal groups for games? Frank says he would choose one for each side until all are chosen, and then count them. Can you divide with numbers?

a. What do you do first?

b. What number do you subtract? Why?

c. How many tens are left to divide? how many ones? What do you do?

d. What number do you subtract? Why?

$$\begin{array}{r} 16 \\ 2\overline{)32} \\ \underline{2} \\ 12 \\ \underline{12} \end{array}$$

2. Suppose Frank had to plan games for the whole school. Divide 175 into 5 equal groups.

a. Are there 17 tens? $17 \div 5 = \underline{?}$. Where is the 3 written? Why?

b. Where does this 25 come from?

c. Tell how to finish the division.

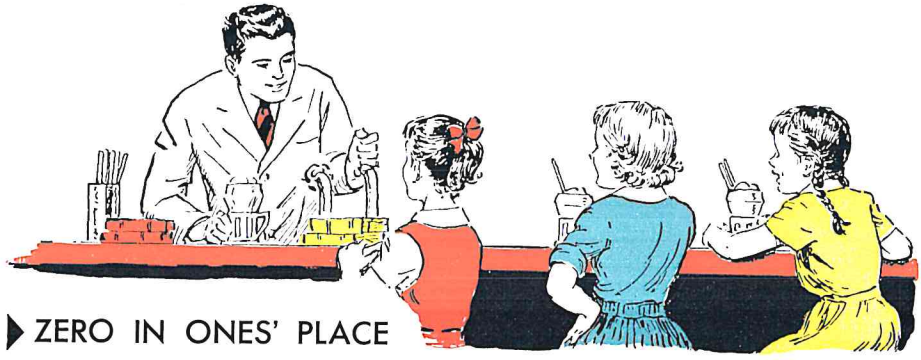
Frank would have how many in each group?

$$\begin{array}{r} 3 \\ 5\overline{)175} \\ \underline{15} \\ 25 \end{array}$$

> Divide tens the way you divide ones. If there is a remainder, use it with the ones to make a new number to divide.

PRACTICE

	a	b	c	d	e	f	g	h
1.	$2\overline{)72}$	$4\overline{)96}$	$3\overline{)102}$	$7\overline{)154}$	$4\overline{)72}$	$6\overline{)144}$	$7\overline{)168}$	$5\overline{)65}$
2.	$4\overline{)68}$	$2\overline{)114}$	$7\overline{)245}$	$3\overline{)75}$	$7\overline{)224}$	$6\overline{)138}$	$7\overline{)252}$	$5\overline{)85}$
3.	$3\overline{)87}$	$5\overline{)90}$	$6\overline{)90}$	$7\overline{)119}$	$6\overline{)204}$	$2\overline{)138}$	$4\overline{)224}$	$6\overline{)96}$
4.	$6\overline{)552}$	$9\overline{)828}$	$3\overline{)54}$	$2\overline{)96}$	$8\overline{)736}$	$4\overline{)152}$	$7\overline{)126}$	$6\overline{)228}$



ZERO IN ONES' PLACE

1. "How much will three ice-cream sodas cost?" asked Jane. "60 cents," said the clerk. How much is that for each soda?

6 dimes ÷ 3 = ?. Are any cents left over? You write zero in the quotient so that the 2 will stand for dimes.

$$\begin{array}{r} 20¢ \\ 3\overline{)60¢} \end{array}$$

2. Divide 150 into 5 equal groups. 150 is 15 tens. 15 ÷ 5 is ?. Why must zero be written in the quotient?

$$\begin{array}{r} 30 \\ 5\overline{)150} \end{array}$$

3. Divide 240 into two equal groups.

240 = ? hundreds, ? tens, and ? ones.

2 hundreds ÷ 2 = ?. Where is the 1 written?

There are 4 left in tens' place. What is 4 tens ÷ 2?

Are there any ones? Why must you be sure to put a zero in ones' place in the quotient?

$$\begin{array}{r} 120 \\ 2\overline{)240} \\ \underline{2} \\ 4 \\ \underline{4} \\ 0 \end{array}$$

• When you divide, be sure to use zeros in the answers when they are needed.

PRACTICE

	a	b	c	d	e	f	g	h
1.	$3\overline{)90}$	$2\overline{)40}$	$4\overline{)80}$	$2\overline{)60}$	$4\overline{)40}$	$3\overline{)60}$	$2\overline{)80}$	$3\overline{)30}$
2.	$5\overline{)250}$	$6\overline{)240}$	$3\overline{)180}$	$7\overline{)210}$	$8\overline{)320}$	$9\overline{)270}$	$4\overline{)280}$	$8\overline{)240}$
3.	$3\overline{)690}$	$2\overline{)260}$	$3\overline{)960}$	$4\overline{)840}$	$2\overline{)260}$	$3\overline{)360}$	$4\overline{)480}$	$2\overline{)460}$
4.	$4\overline{)240}$	$3\overline{)630}$	$7\overline{)280}$	$5\overline{)350}$	$2\overline{)840}$	$6\overline{)300}$	$4\overline{)320}$	$3\overline{)390}$

▶ DIVIDING DOLLARS AND CENTS

1. The class has \$4.86 for its party. How much will each of two committees get? Is the answer money? If it is, you must write the signs to show money. Where is the dollar sign written? the point?

$$\begin{array}{r} \$2.43 \\ 2\overline{)\$4.86} \end{array}$$

2. Three children share \$6.00 equally. How much is each one's share?

3. Joe earns \$6.25 in 5 days. How much is the average for each day? Explain the division.

4. Mary's grandmother gave her \$2.25 to buy dresses for her 3 dolls. If she divides the money equally, how much will she have for each doll?

$$\begin{array}{r} \$1.25 \\ 5\overline{)\$6.25} \\ 5 \\ \hline 12 \\ 10 \\ \hline 25 \\ 25 \\ \hline \end{array}$$

$$\begin{array}{r} \$\ .7 \\ 3\overline{)\$2.25} \\ 21 \\ \hline 15 \end{array}$$

This time there are not enough dollars to divide by 3. So think 22 dimes. Are there 7 threes in 22? Why is the 7 in the dimes' column? Is there 1 dime left over?

Tell how the division is finished.

5. Jack is paying \$1.44 for 6 hamburgers. How much does each one cost?

6. Jean and her twin sister are buying dresses which are alike. The cost of both is \$10.50. What is the cost of each? Explain the division.

$$\begin{array}{r} \$\ 5.25 \\ 2\overline{)\$10.50} \\ 10 \\ \hline 5 \\ 4 \\ \hline 10 \\ 10 \\ \hline \end{array}$$

7. Three tickets for the movie cost \$1.98. What is the price of each ticket?

8. Six quarts of ice cream cost \$3.90. How much does a quart of it cost?

Copy these and divide:

9. $3\overline{)\$4.02}$ **10.** $5\overline{)\$1.75}$ **11.** $6\overline{)\$14.58}$ **12.** $3\overline{)\$18.87}$

REMAINDERS IN ONES' AND TENS' PLACES

1. Fourteen people are to be seated at tables. There are 4 places at each table. What happens?

How many 4's are there in 14? How many are left?

How many tables will be filled? How many will be seated at the fourth table?

$$\begin{array}{r} 3 \\ 4\overline{)14} \\ 12 \\ \hline 2 \end{array}$$

2. There are 25 children for two sides for a game. How many will there be on each side?

25 is 2 tens and 5 ones. $\frac{1}{2}$ of 2 tens = _?_.

What do you subtract? Are any tens left? Does each side now have ten children?

5 children are still to be divided for the two sides. $5 \div 2 =$ _?_. What do you subtract from 5?

Each side now has how many? What shall be done with the child left over?

$$\begin{array}{r} 12 \\ 2\overline{)25} \\ 2 \\ \hline 5 \\ 4 \\ \hline 1 \end{array}$$

3. Mr. Brown has 123 chickens. He wants to sell just half of them. Can he?

How many tens are there in 123? $\frac{1}{2}$ of 12 tens = _?_. 6 tens $\times$ 2 = 12 tens. Taking out 12 tens leaves 3 ones.

$3 \div 2 =$ _?_. What do you subtract from 3? Why?

Mr. Brown has how many groups of 61 each? Is there 1 chicken left over?

$$\begin{array}{r} 61 \\ 2\overline{)123} \\ 12 \\ \hline 3 \\ 2 \\ \hline 1 \end{array}$$

4. How would you divide 33 people into 2 groups? How many will be in each group? How many left over?

5. Copy these and divide.

a. $3\overline{)53}$ **b.** $2\overline{)159}$ **c.** $3\overline{)100}$ **d.** $5\overline{)87}$ **e.** $4\overline{)298}$ **f.** $9\overline{)820}$

DIVIDING INTO GROUPS

Every month Miss Brown's room has a party for all children who have birthdays that month. This is the month for the birthdays of Tony, Helen, and Dick.

1. There will be 31 children at the party. Is there any way to divide 31 into equal groups for games?

2. Divide 31 into 3 groups. How many will there be in each of the 3 groups if you divide them as evenly as you can?

3. How many will there be on a side for games if there are two sides? Can the sides be even?

4. How many groups of 4 each could there be for table games?

5. The tables are placed so that there can be 8 children in each group. How many groups of 8 will there be? How many children will be in the group that is left? How could it become a group of 8?

6. Divide 31 by 2; by 3; by 4; by 5; by 6; by 7; by 8; by 9.

Some numbers can be divided evenly only by themselves and 1.

▶ ZEROS IN THE QUOTIENT

1. You know how to do this example. 4 tens divided by 2 is how many tens? 2 tens are _?_.

$$2\overline{)40}\quad 20$$

2. You know how to do this example. 4 hundreds divided by 2 is how many hundreds? $400 \div 2 =$ _?_.

$$2\overline{)400}\quad 200$$

3. This division is new. Read about it below:

$$2\overline{)406}\quad 2$$

a. Divide 4 by 2. Where is the answer written? Why?

$$2\overline{)406}\quad 20$$

b. Are there any tens in tens' place? What is written in tens' place to show no tens?

$$2\overline{)406}\quad 203$$

c. How many twos are there in 6? Where is the answer written? Why? 406 divided by 2 is how many?

4. Tell what happens as you divide 612 by 3.

a

$$3\overline{)612}\quad 2,\ 6$$

b

$$3\overline{)612}\quad 20,\ 6,\ 1$$

c

$$3\overline{)612}\quad 20,\ 6,\ 12$$

d

$$3\overline{)612}\quad 204,\ 6,\ 12,\ 12$$

5. Tell what happens as you divide 483 by 4.

a

$$4\overline{)483}\quad 1,\ 4$$

b

$$4\overline{)483}\quad 12,\ 4,\ 8,\ 8$$

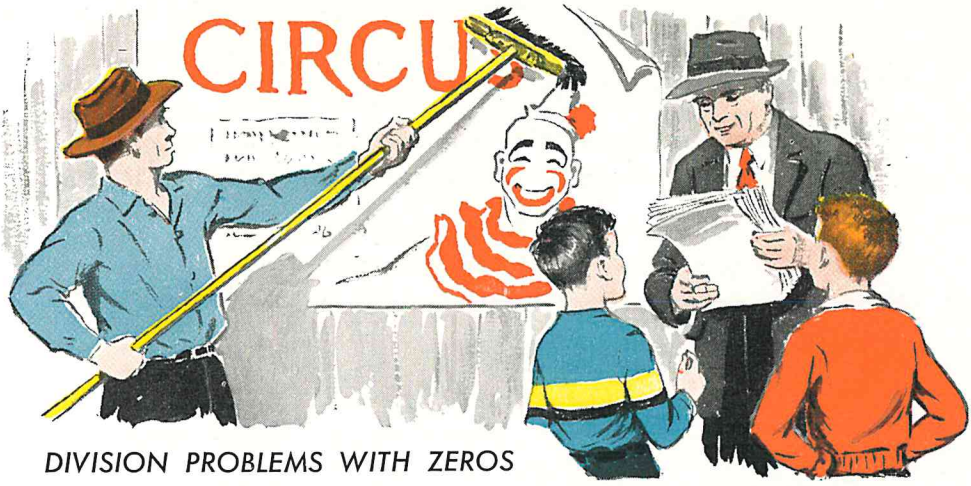
c

$$4\overline{)483}\quad 12,\ 4,\ 8,\ 8,\ 3$$

d

$$4\overline{)483}\quad 120,\ 4,\ 8,\ 8,\ 3$$

6. $3\overline{)906}$ **7.** $4\overline{)816}$ **8.** $3\overline{)619}$ **9.** $2\overline{)421}$ **10.** $5\overline{)702}$



DIVISION PROBLEMS WITH ZEROS

The circus man has 1200 handbills to take to the homes in town. "I want 4 captains," he says, "one for each quarter of the town. Each captain needs 4 helpers. There will be a free ticket for each boy."

1. How many boys does the circus man want to help him?

2. How many handbills do you think each captain gets?

The captain's job is to divide his bills among his 4 helpers. His helpers get tickets when they finish their jobs.

3. A captain gets 300 handbills. If he divides them equally among 4 helpers, how many will each helper get?

▶ CHECKING DIVISION

1. Tell some ways to check these divisions: → $3\overline{)6}$ $3\overline{)7}$

2. Bill multiplies the quotient by the divisor:

$$\begin{array}{r} 2 \\ 3\overline{)6} \\ \underline{6} \end{array} \quad \begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array} \qquad \begin{array}{r} 2 \\ 3\overline{)7} \\ \underline{6} \\ 1 \end{array} \quad \begin{array}{r} 2 \\ \times 3 \\ \hline 6 \\ +1 \\ \hline 7 \end{array}$$

3. Divide and check:

a. $5\overline{)15}$ **b.** $3\overline{)72}$ **c.** $4\overline{)900}$ **d.** $3\overline{)609}$ **e.** $2\overline{)915}$

USING WHAT YOU KNOW

Tell how to divide Example (**a**) in Number 1. Then tell how to divide (**b**) and (**c**). Do 2, 3, and 4 the same way.

	a	b	c		a	b	c
1.	$2\overline{)2}$	$2\overline{)20}$	$2\overline{)200}$	**3.**	$5\overline{)15}$	$5\overline{)150}$	$5\overline{)1505}$
2.	$4\overline{)20}$	$4\overline{)200}$	$4\overline{)2000}$	**4.**	$2\overline{)17}$	$2\overline{)170}$	$2\overline{)1710}$

Copy and divide. Check by multiplying.

5. $6\overline{)3000}$ **6.** $3\overline{)1506}$ **7.** $4\overline{)1612}$ **8.** $3\overline{)1458}$

PRACTICE

Set 1

	a	b	c	d	e	f
1.	$6\overline{)72}$	$2\overline{)56}$	$8\overline{)96}$	$5\overline{)170}$	$4\overline{)184}$	$3\overline{)87}$
2.	$7\overline{)364}$	$5\overline{)90}$	$6\overline{)156}$	$3\overline{)138}$	$7\overline{)91}$	$5\overline{)480}$
3.	$3\overline{)54}$	$7\overline{)168}$	$4\overline{)72}$	$6\overline{)\$2.58}$	$4\overline{)\$.60}$	$3\overline{)\$17.10}$

Set 2

	a	b	c	d	e	f
1.	$8\overline{)17}$	$9\overline{)21}$	$2\overline{)83}$	$8\overline{)89}$	$2\overline{)167}$	$2\overline{)109}$
2.	$3\overline{)108}$	$8\overline{)257}$	$8\overline{)489}$	$4\overline{)374}$	$6\overline{)308}$	$9\overline{)747}$

Set 3

	a	b	c	d	e	f
1.	$4\overline{)80}$	$3\overline{)900}$	$2\overline{)604}$	$4\overline{)160}$	$5\overline{)515}$	$2\overline{)508}$
2.	$5\overline{)550}$	$4\overline{)813}$	$3\overline{)962}$	$6\overline{)706}$	$4\overline{)607}$	$3\overline{)200}$
3.	$2\overline{)1800}$	$8\overline{)4000}$	$3\overline{)2928}$	$2\overline{)1402}$	$4\overline{)2732}$	$5\overline{)4025}$

▶ DIVIDENDS, DIVISORS, AND QUOTIENTS

Jean's mother is baking 12 cupcakes. She says to Jean, "If Susan, Sally, and Marian can come home with you tonight, you may have cakes and orange juice."

1. What fraction will be an equal share for each of the 4 girls? How many is $\frac{1}{4}$ of 12?

2. If one girl does not come, what fraction will be an equal share for each of the others? How many cakes?

3. If two more girls come with the four girls, what fraction will be each one's equal share? How many cakes?

UNIT TEST

1. $2\overline{)24}$	**2.** $3\overline{)126}$	**3.** $2\overline{)842}$	**4.** $4\overline{)80}$	**5.** $5\overline{)250}$
6. $4\overline{)9}$	**7.** $3\overline{)19}$	**8.** $2\overline{)36}$	**9.** $5\overline{)160}$	**10.** $6\overline{)75}$
11. $4\overline{)47}$	**12.** $3\overline{)215}$	**13.** $2\overline{)285}$	**14.** $3\overline{)900}$	**15.** $2\overline{)406}$
16. $5\overline{)1000}$	**17.** $4\overline{)1208}$	**18.** $6\overline{)1218}$	**19.** $5\overline{)2620}$	**20.** $4\overline{)1810}$
21. $2\overline{)\$7.00}$	**22.** $6\overline{)\$.90}$	**23.** $2\overline{)\$1.80}$	**24.** $5\overline{)\$3.05}$	**25.** $4\overline{)\$17.20}$
26. $3\overline{)360}$	**27.** $3\overline{)164}$	**28.** $4\overline{)824}$	**29.** $7\overline{)3585}$	**30.** $3\overline{)\$25.89}$

FINDING THE TROUBLE SPOTS

MEANING

Number an answer sheet from 1 to 10.

1. Write the name of the digit that means *not any*. 176

2. Write the first of the ten digits. Write each of these numbers in words: 60 104 2005 5, 179

3. How many tens are there in 100? in 200? 31, 178

4. Estimate the length of each line in inches:

a. _____ **b.** _____ 112

5. Estimate the inches from the top to the bottom edge of this page. 113

6. Write the **odd** numbers which are among these: 206

6 7 10 15 34 209 571 207

7. Which of these parts of a number is smallest?

a. $\frac{1}{3}$ of it **c.** $\frac{1}{2}$ of it

b. $\frac{1}{5}$ of it **d.** $\frac{1}{4}$ of it

8. Write the time for *A*; for *B*.

A

B

9. Here is part of a calendar. On what day is the 4th? On what day is the 16th? 215, 218

SUN	MON					SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13

PROBLEM SOLVING

Write the answer to each problem:

1. Jack is going to measure for a 50-yard race. How many feet will that be? 114

2. Frank is 5 feet tall. The chart says a boy of his age is usually 58 inches. How many inches is 5 feet?

3. Which is more, 9 quarters or $2.32? 84

4. You are buying 5 ice-cream cones. What else do you need to know to tell how much money all 5 will cost? 228 229

5. You know how much you weigh. What else do you need to know to tell how many pounds you have gained since school started?

6. What else do you need to know to tell how much money you and Betty have together? You have $1.25.

7. What should Louise pay for 5 birthday cards which cost 25¢ each? 230

Which answer is most reasonable?

$12\frac{1}{2}$¢ $1.25 $12.50 $125.00

8. Tom left home at 1:05 and arrived home at 3:55. About how long was he gone?

1 hr. 2 hr. 3 hr. 4 hr.

9. Write a problem about finding how many there are all together of something you know about. 224 225

10. Write a problem about buying something. Suppose you do not have enough money to buy it.

11. Write a problem of your own about how many of something you will have left. You did something with part of them.

SUBTRACTION, MULTIPLICATION, DIVISION

Set 1. Zeros in Subtraction

(1)	(2)	(3)	(4)	(5)
\$1.40	\$3.20	\$4.30	\$1.50	\$5.05
.25	1.50	3.70	.79	4.10

(6)	(7)	(8)	(9)	(10)
300	200	600	100	500
153	124	507	60	392

(11)	(12)	(13)	(14)	(15)
424	516	770	903	701
308	400	678	723	572

(16)	(17)	(18)	(19)	(20)
413	815	114	215	116
314	608	6	206	89

Set 2. Zeros in Multiplication

(1)	(2)	(3)	(4)	(5)
102	320	\$4.00	601	840
4	2	3	7	9

(6)	(7)	(8)	(9)	(10)
103	507	\$1.09	\$10.25	\$14.06
6	5	8	9	4

(11)	(12)	(13)	(14)	(15)
\$1.05	\$1.59	\$2.58	\$5.05	\$5.90
7	6	4	8	2

Set 3. Zeros in Division

(1)	(2)	(3)	(4)	(5)
$4\overline{)800}$	$7\overline{)210}$	$2\overline{)604}$	$3\overline{)918}$	$5\overline{)1005}$

(6)	(7)	(8)	(9)	(10)
$2\overline{)106}$	$5\overline{)2010}$	$3\overline{)3021}$	$4\overline{)1612}$	$2\overline{)504}$

ESTIMATING

Do not work with pencil and paper, but think about how many dollars the answer will be, as \$1, \$2, \$3, and so on. Write your estimated answer. 88, 90, 197, 237

Find the total cost of:

1. 4 balls at 98¢ each.
2. 6 dolls at \$1.49 each.
3. 4 bats at \$1.24 each.
4. 10 books at \$1.50 each.
5. 10 papers at 8¢ each.
6. 5 tickets at \$1.19 each.
7. 100 pencils at 5¢ each.
8. 6 sodas at 15¢ each.

Write the cost of each, if:

9. 3 jeans cost \$8.97.
10. 2 tires cost \$3.98.
11. 6 footballs cost \$24.90.
12. 5 shirts cost \$9.75.
13. 4 meals cost \$4.20.
14. 3 tickets cost \$28.50.
15. 5 desks cost \$99.75.
16. 6 chairs cost \$35.58.

DIVISION

Set 1

1. $6\overline{)25}$	**2.** $3\overline{)22}$	**3.** $5\overline{)18}$	**4.** $8\overline{)35}$	**5.** $4\overline{)19}$	200–208
6. $9\overline{)70}$	**7.** $6\overline{)59}$	**8.** $7\overline{)45}$	**9.** $4\overline{)37}$	**10.** $8\overline{)59}$	

Set 2

1. $2\overline{)32}$	**2.** $3\overline{)78}$	**3.** $5\overline{)90}$	**4.** $7\overline{)168}$	**5.** $4\overline{)140}$	234
6. $8\overline{)98}$	**7.** $4\overline{)49}$	**8.** $6\overline{)157}$	**9.** $7\overline{)359}$	**10.** $5\overline{)108}$	238
11. $3\overline{)600}$	**12.** $2\overline{)804}$	**13.** $3\overline{)912}$	**14.** $2\overline{)621}$		240
15. $4\overline{)825}$	**16.** $6\overline{)804}$	**17.** $3\overline{)505}$	**18.** $3\overline{)700}$		
19. $2\overline{)506}$	**20.** $6\overline{)908}$	**21.** $7\overline{)\$9.59}$	**22.** $4\overline{)\$2.96}$		237
23. $2\overline{)\$9.00}$	**24.** $5\overline{)\$20.00}$	**25.** $9\overline{)\$45.81}$			
26. $9\overline{)1800}$	**27.** $9\overline{)3087}$	**28.** $8\overline{)4808}$			242
29. $5\overline{)2895}$	**30.** $8\overline{)4072}$				

UNIT 23

PROBLEMS WITH TWO QUESTIONS

OUR PUPPET SHOW

The children in Betty's room have made puppets. They are planning a puppet show.

1. The show has three parts. The parts take 7 minutes, 8 minutes, and 12 minutes. Will a half hour be enough time for the show?

An idea. Add the minutes together first.

2. There are 120 chairs in the auditorium. Children from four rooms are coming. The numbers of children in the rooms are 28, 33, 29, and 34. Will more chairs be needed?

An idea. Add the numbers of children first. Then say the problem in another way.

3. There are 31 children in Betty's room. All of them want something to do. Eight will have puppets, 2 will play records, 4 will turn the lights on and off and pull the curtains, and 4 will be ushers. How many children still need something to do?

4. What are good jobs for the others to do?

THE UNKNOWN NUMBER

1. No child was to spend more than $1.00 for his puppet. How much less than $1.00 did each of these eight puppets cost?

Four children listed their costs this way:

	JOHN	BETTY	JANE	FRED
Paint	3¢	3¢	2¢	4¢
Wire	2¢	2¢	3¢	1¢
Cloth	37¢	28¢	29¢	46¢
Wood	9¢	7¢	8¢	7¢
Ribbon	28¢	38¢	27¢	18¢

An idea. Find the cost for each pupil first. Use folded paper.

2. The other four children listed their costs this way:

	Paint	Wire	Cloth	Wood	Ribbon
ARLENE	2¢	2¢	27¢	7¢	26¢
TONY	4¢	3¢	36¢	8¢	36¢
BUDDY	3¢	3¢	37¢	9¢	28¢
CAROL	3¢	1¢	29¢	6¢	27¢

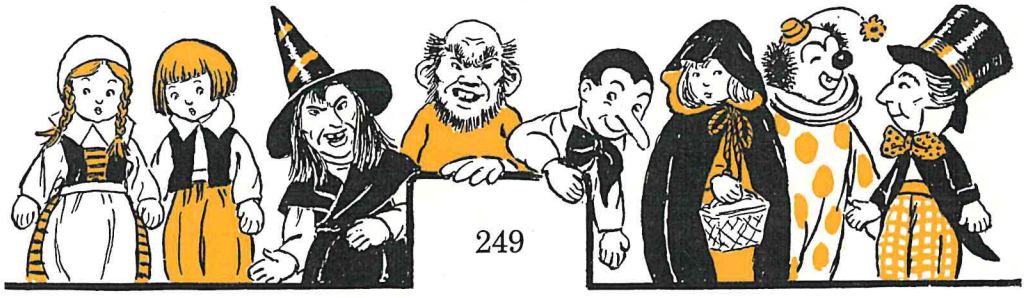
How much less than $1.00 did each one spend?

Is folded paper easy to use this time?

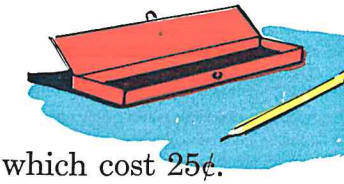
3. Which list was easier to add?

4. How much did all 8 puppets cost? How much less than the total allowance was spent for puppets?

5. List the names and what each child spent. Put the name with the highest cost first, then next, and so on, till the cheapest cost is last. Who saved most?



QUESTIONS YOU THINK



1. How much change should Jane get back? She gave the clerk $1.00 for a pencil which cost 5¢ and a pencil box which cost 25¢.

Think this question: How much do the pencil and the box cost together?

2. Dick has $10.00. How much money will he have left if he spends $3.75 for a glove and $1.35 for a ball?

Think this question: What do the glove and the ball cost together?

3. How much will Sandra have left from $5.00? Skates will cost her $2.98. She wants a scarf at $1.50.

What question must you think?

4. Seventy-two children will go to the school picnic. Thirty-two of them will ride in the school bus. How many cars will be needed to take the rest of the children? Five will ride in each car.

What is the question you think?

5. Half of the 72 children want to play softball. How would you divide the rest for two kickball teams?

What question do you think first?

6. How long will the children be at the picnic grounds? They will leave for the picnic at 9:00 A.M. It takes an hour to go and an hour to return. They will get back at 3:30 P.M.

PRACTICE. Multiplication

	a	b	c	d	e	f	g
1.	486	473	346	358	358	746	748
	3	5	7	4	9	8	6
2.	968	795	539	467	859	976	539
	5	3	6	9	7	4	8

DRAW A PICTURE TO HELP

Draw a picture for each of these problems. See if it helps find the question you think, or the unknown number.

1. In Bill's town the length of 16 blocks makes a mile. The blocks are square. Bill rode his bicycle around a block 8 times. How many miles did he ride?

Draw a small square block. Then draw a line that is 16 blocks long. Does this give you an idea?

2. "Which way shall we go to the lake, Jack?" asked his dad. "By the river road it is 8 miles east and 12 miles southeast. By the paved highway it is 6 miles south and 16 miles east." What is the difference in miles between these two ways?

What two other questions must Jack answer first? Draw a picture of each way.

"To go to Centerville," the farmer said, "you go 8 miles east to the highway, 14 miles south on the highway to where it crosses Highway 23, then 2 miles back west. Another road straight south from here is a little rough, but you can save some miles by going 14 miles south to Highway 23 and then straight east." How far east would one have to go? How many miles would be saved this way? Draw a picture of each way.

PRACTICE

	a	b	c	d	e	f
1.	$2\overline{)24}$	$4\overline{)240}$	$3\overline{)693}$	$5\overline{)360}$	$2\overline{)38}$	$3\overline{)285}$
2.	$3\overline{)73}$	$2\overline{)684}$	$4\overline{)48}$	$8\overline{)720}$	$3\overline{)690}$	$7\overline{)441}$
3.	$6\overline{)487}$	$4\overline{)89}$	$2\overline{)608}$	$5\overline{)2000}$	$4\overline{)836}$	$3\overline{)87}$
4.	$4\overline{)85}$	$6\overline{)277}$	$8\overline{)400}$	$9\overline{)909}$	$7\overline{)735}$	$9\overline{)64}$

PLANNING AN ARITHMETIC PARTY

Kathy is chairman of the committee for the Arithmetic Party. The committee has $5 to spend.

1. "Let's spend $3.50 for food, $1 for decorations, and about $1.50 for invitations," said Tom. "I think it would be fun to have an invitation come in the mail Saturday." What do you think Kathy will say about spending that much money?

2. The committee decides to spend $3 for food, $1.50 for mailing invitations, and 50¢ for funny little prizes. If 30 stamps cost 3¢ each, how much of the $1.50 will be left for envelopes and paper for invitations?

3. If 30 ice-cream cups cost 6¢ each, how much of the $3.00 for food will be left for cupcakes?

4. If cupcakes cost 4¢ each, how much will 30 cupcakes cost?

5. Copy these and add:

a	b	c	d	e	f	g	h
48	74	70	78	9	48	39	55
54	37	38	5	48	77	97	98
65	12	76	96	86	37	83	9
43	65	69	55	67	96	44	87

Get ready for the guessing games on page 257. You may want to practice for them.

MAKING PROBLEMS WITH TWO QUESTIONS

Jack sells papers. He plans to spend $10 of the money he has earned. He put another $10 in his savings bank for summer camp.

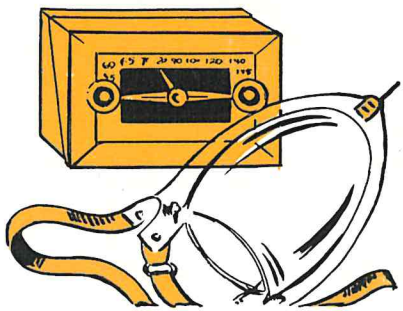
1. Make a problem about how much money Jack now has from his paper route.

2. Make a problem about buying a bicycle horn and a kick-up stand from Jack's list. Make it with two questions.

3. Make a problem about buying a T-shirt and a space helmet. Make it with two questions.

4. Make a problem with two questions about buying a speedometer and a ball glove.

5. Make a problem about buying a radio. Does it have one question or two?

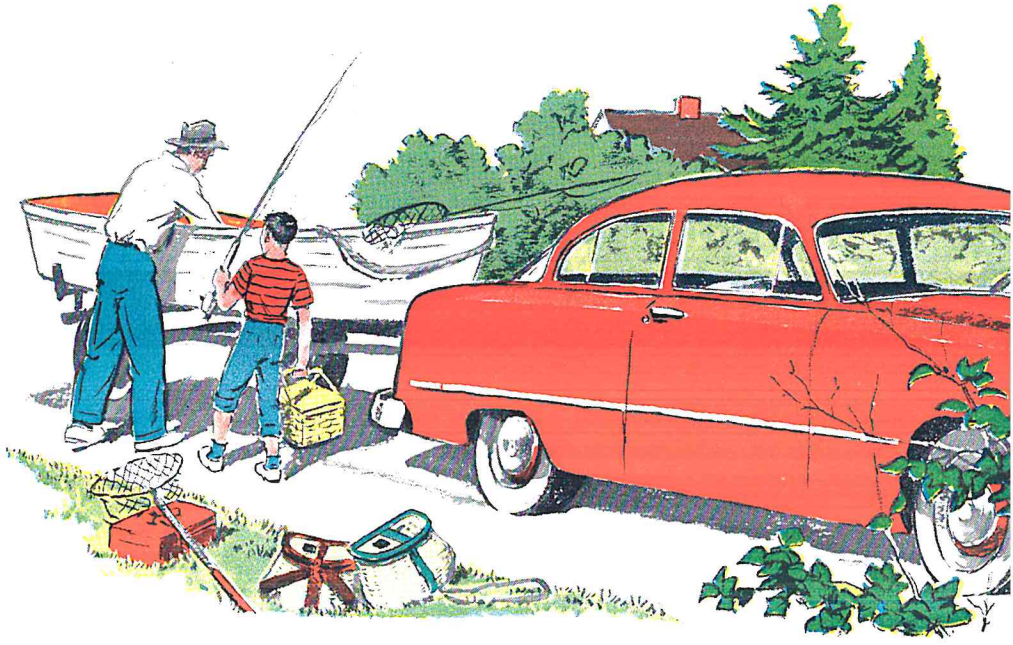


6. If Jack buys a space helmet, what else can he buy?

7. Make a problem of your own that has two questions.

8. Copy these and add:

a	b	c	d	e	f
$1.89	$2.44	$9.32	$5.68	$2.79	$1.56
2.75	0.63	8.46	9.95	9.97	5.89
2.67	8.04	5.23	4.37	1.78	4.98



A FISHING TRIP

1. Lake Wilson is 60 miles away. Jerry's dad says they can average about 30 miles an hour with the car pulling the boat trailer. When will they have to start to get there by 9:00 A.M.? Can you work this by subtraction?

2. Dad says they will fish for 4 hours. They plan to leave the boathouse at 10:00 A.M. It takes an hour to go to where they fish and an hour to come back. About when may they be expected back at the boathouse?

Will a picture of a clock face help you?

3. Jerry and his dad will leave home at 7:00 A.M. They plan to start back home at 4:00 P.M.

How long will they have been gone from home in all?

4. They plan to fish from 11:00 A.M. to 3:00 P.M. Last time they caught 8 fish in one hour. If they catch fish at the same rate, how many fish will they catch?

PRACTICE

Subtract:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
60	485	234	382	176	640	256	424
42	440	214	363	144	608	206	407
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
300	207	402	500	205	735	310	106
275	177	346	402	190	642	276	84
(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
110	450	610	360	108	416	314	100
84	390	590	282	102	378	280	78

TESTING YOURSELF

Use an answer strip.

Subtraction
"13 minus 6"

(1)	(11)
13 − 6	15 − 7
14 − 8	13 − 8
12 − 7	15 − 6
14 − 5	17 − 9
17 − 8	13 − 5
(6)	(16)
13 − 7	15 − 8
15 − 9	14 − 9
16 − 7	13 − 4
11 − 3	14 − 6
13 − 9	16 − 9

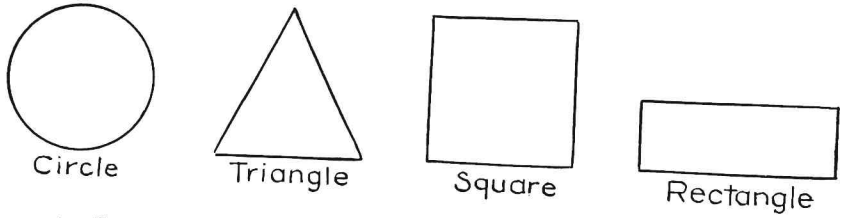
Multiplication
"6 fours"

(1)	(11)
6 × 4	8 × 3
3 × 7	7 × 4
4 × 5	6 × 8
9 × 3	9 × 4
3 × 6	8 × 7
(6)	(16)
9 × 7	5 × 8
4 × 3	6 × 7
8 × 4	9 × 6
9 × 5	4 × 7
4 × 4	9 × 8

Division
How many "6's in 18"?

(1)	(11)
6's in 18	8's in 40
5's in 35	4's in 28
3's in 24	5's in 45
6's in 36	7's in 42
8's in 72	8's in 64
(6)	(16)
4's in 24	6's in 54
7's in 49	7's in 56
3's in 27	8's in 48
5's in 30	4's in 32
4's in 36	7's in 63

RIDDLES — WHAT SHAPE AM I?



1. I am used to make wheels. Which shape am I?
2. I am used many times to make a checkerboard.
3. Jar lids are shaped like me.
4. I am used to make strong bridges.
5. One of my shapes is like your writing paper.
6. The chalkboard looks like me.
7. I am the shape of the face of the clock in your classroom.
8. I am the shape of the floor of your room.
9. We are used for a chalk box.
10. We have square corners.
11. A brick is my shape.
12. I am part of a track that can turn a whole train to go back the way it came.

THE PARTY CONTESTS

Kathy asks that each pupil say a number in his turn. "Begin with one and count off," she says. After each says his number, Kathy says, "The odds will sit on this side and the evens on that side. The committee will be the judges."

Two children from each side do each contest. They go to the chalkboard and write their guesses at the same time.

Give two points for winners and one for seconds.

1. "This bag has corn meal in it. Lift it and guess what it weighs." (Partially empty.)

2. "Guess how many beans are in this jar." (Use pickle jar between pint and quart.)

3. "Guess how many inches it is from *A* to *B*." (*A* and *B* are marks on chalkboard less than 1 yd. apart.)

4. "Guess how many feet it is from *C* to *D*." (Same as Exercise 3, but several yards apart.)

5. "How far is it between these two marks on the floor? Estimate by stepping the distance." (Across front of room.)

6. "Estimate the number of seconds from when I say 'go' until I say 'stop.' " (The time should be less than 60 seconds and not end in 5 or 0.)

7. "Guess how high this mark is from the floor?" (Mark on chalkboard about as high as the children can reach.)

8. "The next four will go to the chalkboard." Then say, "Draw a line that you think is 18 inches long."

ADD, SUBTRACT, MULTIPLY, OR DIVIDE?

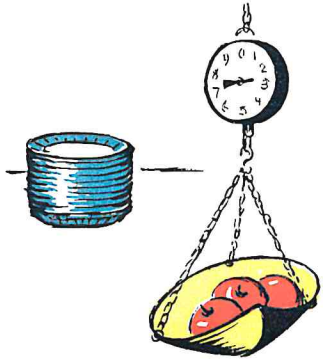
In problems with two questions, you may add twice or subtract twice, or one of each. You may multiply or divide, too. Tell what you would do in each of the problems below:

1. You know that your family uses 3 quarts of milk each day. You know the cost of a quart of milk. How do you find the cost of milk for a week?

2. You know how many hours you sleep each day. You know how many hours you are in school each day. How much time have you to do things during a school day?

3. You know that you earn $1.50 a day for 20 days. You want a bicycle. What else do you need to know and what do you do?

4. You have a dollar bill. You are buying 3 pounds of fruit. You know what it costs a pound. How will you find out how much money you should have left?



5. You are riding your bicycle on a level road. You know when you left home and when to be back. How can you tell when to turn and start home?

6. You know what a package of 10 paper plates costs. You know that 30 children will use plates. How will you estimate the money needed?

7. You know how many children there are. You know how many doughnuts each child will be served. How will you tell how many packages of doughnuts to buy if there are 6 in a package?

PRACTICE

Set 1. Multiplication

	a	b	c	d	e	f	g
1.	23 × 7	93 × 9	74 × 5	853 × 4	74 × 3	463 × 6	493 × 8
2.	968 × 3	258 × 9	769 × 4	897 × 6	486 × 7	865 × 8	759 × 7
3.	900 × 5	470 × 9	704 × 8	356 × 9	608 × 5	685 × 6	806 × 7
4.	\$4.65 × 8	\$3.79 × 6	\$3.89 × 4	\$4.79 × 7	\$6.75 × 4	\$2.35 × 7	\$4.98 × 9

Set 2. Division

	a	b	c	d	e	f
1.	$9\overline{)29}$	$5\overline{)37}$	$7\overline{)33}$	$4\overline{)15}$	$9\overline{)74}$	$8\overline{)25}$
2.	$4\overline{)160}$	$3\overline{)180}$	$8\overline{)720}$	$7\overline{)350}$	$8\overline{)320}$	$9\overline{)540}$
3.	$9\overline{)459}$	$4\overline{)248}$	$6\overline{)486}$	$8\overline{)408}$	$3\overline{)279}$	$7\overline{)497}$
4.	$3\overline{)248}$	$5\overline{)409}$	$6\overline{)427}$	$8\overline{)569}$	$7\overline{)639}$	$4\overline{)329}$
5.	$6\overline{)576}$	$4\overline{)388}$	$9\overline{)666}$	$7\overline{)602}$	$8\overline{)688}$	$5\overline{)480}$

TESTING YOURSELF

Use an answer strip. See also pages 318 and 319

(1)	(6)	(11)	(16)	(1)	(6)	(11)	(16)
9 + 5	8 + 9	9 + 8	7 + 9	13 − 6	17 − 8	17 − 9	13 − 8
7 + 6	9 + 6	6 + 7	5 + 8	14 − 8	15 − 7	15 − 7	14 − 6
9 + 4	7 + 5	8 + 5	8 + 7	12 − 7	16 − 7	14 − 9	15 − 8
6 + 9	5 + 9	9 + 7	4 + 9	14 − 5	11 − 3	13 − 5	13 − 4
5 + 7	8 + 6	6 + 8	7 + 8	13 − 7	13 − 9	15 − 6	16 − 9

UNIT 24

AVERAGES

THE MIDDLE SPEED AND MIDDLE SIZE

1. Do you know who is the fastest runner in your class? Is there someone else nearly as fast? Are there several about in the middle for speed?

Have you ever heard people near the middle in speed, or height, or weight called about **average?**

2. Martha's mother likes to buy vegetables and fruit that are about average in size. She wants them about middle sized. "If they are small," she says, "the peeling wastes so much. Big ones do not taste as good as those of average size." How big is an average sized potato?

3. Does your mother ever make very small pies? Use your hands to show the usual size of her pies. This is called an average sized pie for your mother.

4. Have you ever seen a jumbo pencil? a tiny pencil? Show on your ruler the length of an average new pencil. How long is it?

5. Is an average sized person the biggest?

6. If you are about the average weight of your class, are you either heaviest or lightest?

7. Is a boy who is an average runner either the fastest or the slowest?

AVERAGES HELP FIND EQUAL SHARES

Jane, Tom, and Billy are playing Hide the Nickel with their grandpa. They close their eyes, and he hides nickels for them to find.

This time Jane finds 6. Tom finds 5. Billy finds only 1. After each game, the three children share the nickels equally. How many nickels should each one get this time?

JANE	6 nickels	Add all the nickels together.
TOM	5 nickels	Then divide by three for
BILLY	1 nickel	three children.
TOTAL	12 nickels	$12 \div 3 = 4$.

Each child's equal share is 4 nickels.

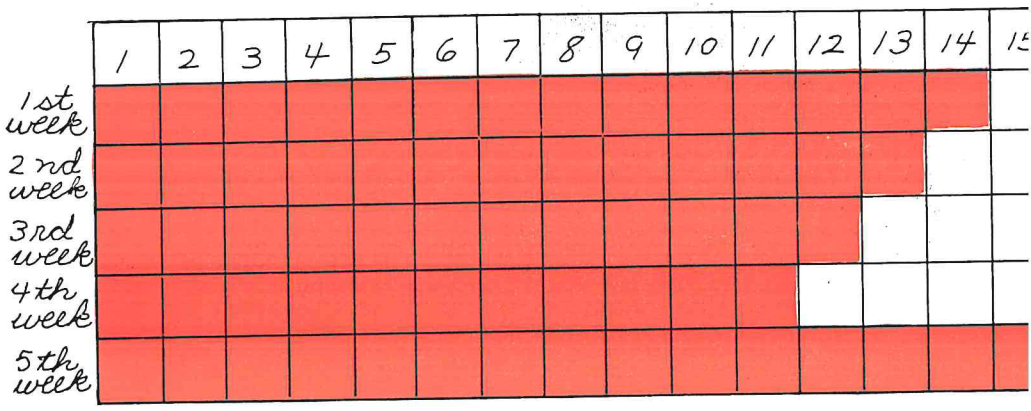
• When anything is divided into parts of the same size, the part each person gets is an equal share. This is an **average** amount.

1. What is an equal share if 4 boys divide 60 lb. of grain to feed their pets?

2. What is an equal share if 3 girls divide 12 yd. of ribbon?

3. Find these parts:

a. $\frac{1}{3}$ of 27	**d.** $\frac{1}{5}$ of 45	**g.** $\frac{1}{8}$ of 32	**j.** $\frac{1}{6}$ of 24
b. $\frac{1}{6}$ of 12	**e.** $\frac{1}{2}$ of 16	**h.** $\frac{1}{10}$ of 100	**k.** $\frac{1}{2}$ of 18
c. $\frac{1}{4}$ of 36	**f.** $\frac{1}{3}$ of 21	**i.** $\frac{1}{4}$ of 28	**l.** $\frac{1}{5}$ of 40



FINDING THE AVERAGE

This chart shows Bill's scores on the spelling tests he took during the first five weeks of school. Bill says he may not get a perfect score every week, but he wants to keep a high average.

1. For which week were all the words right?

2. Which week did Bill miss only one?

3. Which was Bill's poorest week?

4. How many words was Bill's poorest score? Count one square for each word.

5. How many words did Bill have right the second week? the third week? the first week?

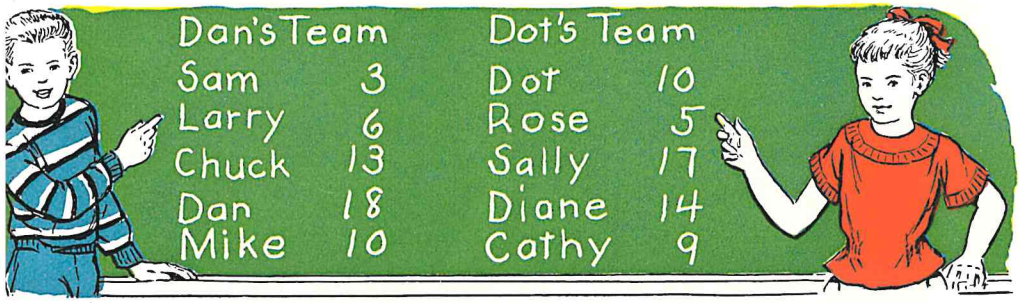
6. Look at the chart and choose the number of words that looks as if it would be about the middle-sized score of Bill's tests. This is about his *average*.

7. If Bill's average is 13, does this mean that he spells as well as a boy who gets 13 every day?

14
13
12
11
15
65

$5\overline{)65}$

To find the average, you add all the scores (or weights, or heights, and so on), and divide the sum you get by the number of scores you added.



FINDING AVERAGES

1. Lincoln School has ringtoss teams. Which team is ahead, Dan's or Dot's?

DAN'S TEAM		DOT'S TEAM	
SAM	3	DOT	10
LARRY	6	ROSE	5
CHUCK	13	SALLY	17
DAN	18	DIANE	14
MIKE	10	CATHY	9

2. Which boys and girls are above average on their team? First you must find the average. Dan did it this way for his team. He added all the scores. Then he counted the different scores and divided by the number of them. The number was 5. $50 \div 5 = 10$. *10* is the *average*.

$$\begin{array}{r} 3 \\ 6 \\ 13 \\ 18 \\ \underline{10} \\ 50 \end{array} \qquad 5\overline{)50}\ 10$$

3. Is Chuck above the average for his team?

4. If Sam practices may he raise the average?

5. Find the average for Dot's team. Is it higher than the average for Dan's team?

6. Is Dot below the girl's average? Is Rose? Is Cathy?

7. Find the average for each example below. Use the rule on page 262.

a.	**b.**	**c.**	**d.**	**e.**	**f.**	**g.**	**h.**
6	4	9	12	18	26	43	26
3	7	9	14	21	35	38	32
3	7	6	16	15	32	54	23

i.	**j.**	**k.**	**l.**	**m.**	**n.**	**o.**	**p.**
8	4	7	8	12	13	10	16
8	3	5	6	8	7	9	18
7	5	9	4	6	7	7	22
5	4	7		6		6	20

AVERAGE DISTANCES

Peg and Jim live in Florida. They are planning a summer trip to Maine by automobile. Dad says they will average about 300 miles a day. He says they may go 400 miles some days and maybe only 200 miles on other days. If Dad drives 1500 mi. in 5 days, what will the daily average be?

The average is the number of miles a person would go in one day if the miles for all days were evened up.

1. About what average distance must an automobile go each day on each of the following trips?

THE TRIP	DISTANCE	TOTAL DAYS
1. New York to Indianapolis	730	2
2. Washington to New Orleans	1203	3
3. Los Angeles to St. Louis	1925	5
4. Minneapolis to El Paso	1569	3
5. San Francisco to Chicago	2235	5
6. Atlanta to Miami	678	2

2. Bobby Smith's family plan to drive to his grandmother's next summer. Mr. Smith says they will average about 300 miles a day. It will take 3 days. How far would they go in 3 days at an average of 300 miles daily?

3. On what kinds of roads should the average speed be low?

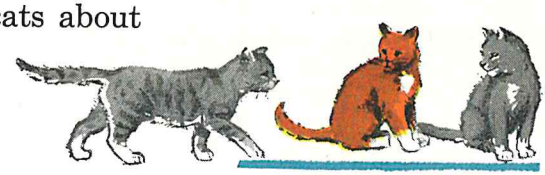
4. On what kinds of roads could the average speed be fast?

"JUST ABOUT AVERAGE"

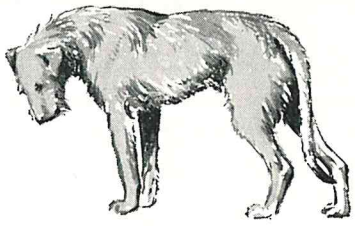
Have you heard someone say, "He's an average boy"? or "It's an average day"? or "I have had an average week"? or "Give me one that is about average size"?

1. Do you sometimes walk fast and sometimes very slowly? Is your speed about average most of the time?

2. Are most grown cats about average in size? Have you seen a very big one?



3. Are more cats or more dogs about average in size?



4. Is the wind blowing hard today, or is it just about average?

5. Is this a hot day, a cold day, or just about average?

6. How good was the last television or radio program you heard? Was it good, or poor, or just about average?

7. Is your average good enough in these:

The way you help your mother?

The way you pick up your playthings?

Your manners?

How can you change an average?

PRACTICE

Find the averages of these miles:

1. 183, 256, and 173

2. 259, 374, and 385

3. 467, 409, and 358

4. 127, 98, 100, and 96

5. 69, 67, 79, and 78

6. 68, 87, 59, and 68

HOW MANY PAGES IS YOUR AVERAGE?

Five children in Miss Jones' room were comparing their reading speeds.

1. Hazel read her book in 4 days. It has 248 pages. How many pages a day did she read on an average?

2. Paul read his book in 5 days. It has 250 pages. How many pages did he average in a day?

3. Donna Jean read 186 pages in 3 days. What was her average for a day?

4. George read 96 pages in 4 days. How many pages did he average for a day?

5. Laura's book was a big one. She read 328 pages in 8 days. How many did she average?

6. Put the averages per day on the chalkboard. Which one averaged the most pages per day?

7. Which one is the fastest reader? Can you tell for sure? Alice says these figures do not tell which one reads the *fastest.*

Why do you think Alice says that? Do you need to know something else to tell who reads fastest?

8. What would you need to know to be sure that George is a slow reader?

9. Do you know whether everyone read every day?

10. Is the number of hours given for the time each child read?

11. How would you find out how *fast* each child really reads?

FINDING AVERAGES

Find the average for each example below:

1. Equal shares for 3 children: 18, 22, 32.

2. Spelling words for 5 weeks: 12, 13, 10, 9, 11.

3. Miles traveled for 4 days: 220, 340, 270, 290.

4. Weight in pounds of 5 melons: 18, 22, 25, 23, 27.

5. Money earned in 4 days: 50¢, 20¢, 30¢, 40¢.

6. Basketball scores for 4 games: 24, 20, 32, 28.

TESTING YOURSELF

Use an answer strip. See also pages 318, 319.

(1)	(7)	(13)	(1)	(7)	(13)	(19)
21 ÷ 3	18 ÷ 6	24 ÷ 8	48 ÷ 6	30 ÷ 5	45 ÷ 5	32 ÷ 4
20 ÷ 4	27 ÷ 9	18 ÷ 3	24 ÷ 3	49 ÷ 7	28 ÷ 4	27 ÷ 3
15 ÷ 5	35 ÷ 5	45 ÷ 9	40 ÷ 5	54 ÷ 9	35 ÷ 7	48 ÷ 8
81 ÷ 9	24 ÷ 6	36 ÷ 6	36 ÷ 9	40 ÷ 8	36 ÷ 4	56 ÷ 7
25 ÷ 5	72 ÷ 9	72 ÷ 8	24 ÷ 4	63 ÷ 9	42 ÷ 6	54 ÷ 6
30 ÷ 6	32 ÷ 8	28 ÷ 7	56 ÷ 8	64 ÷ 8	63 ÷ 7	42 ÷ 7

GROWTH TEST

1. 6×601

2. $23 \div 3$

3. $400 - 360$

4. $9 + 7 + 8 + 9$

5. 7×907

6. $70 \div 2$

7. $370 \div 5$

8. $334 \div 9$

9. $973 - 575$

10. 9×640

11. $800 - 237$

12. $504 \div 6$

13. $200 \div 8$

14. 4×978

15. 8×628

16. $918 \div 3$

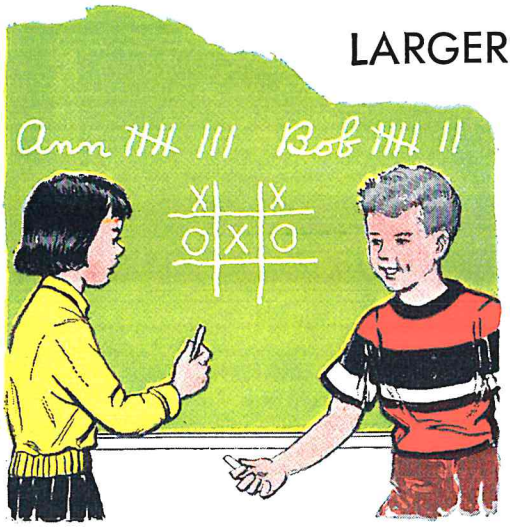
17. 7×458

18. $510 - 430$

19. $9 + 348 + 85 + 988$

20. $68 + 96 + 90 + 77$

LARGER NUMBERS



MEANING OF A TALLY

Bob and Ann are tallying their scores.

What does **tally** mean? Is tallying a good way to count?

"Your turn," said Bob. "It's mine either way."

"I'll give up," said Ann. "Now we're tied."

1. Does it matter where Ann marks? Can she win?

2. What is a tie score? Can large scores be tied?

3. Has Bob tallied his score for this game on the chalkboard yet? How many games has Bob won? How many has Ann won?

4. If Ann wins another game, will she need to erase to make a new number?

5. Who won this game? What is the score for this game called?

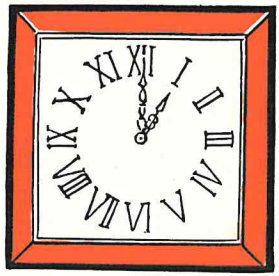
6. Are tallies better for small or large numbers?

PRACTICE

Copy and multiply:

	a	b	c	d	e	f	g
1.	478 × 6	948 × 3	586 × 5	968 × 7	638 × 4	497 × 5	493 × 8
2.	367 × 3	479 × 9	369 × 6	279 × 4	743 × 7	678 × 8	368 × 8

UNDERSTANDING ROMAN NUMERALS



1. Clocks have two kinds of numbers for hours. The hours on this clock are shown by Roman numerals. Read them.

What time does the clock show?

2. How are the 1, 2, and 3 made?

3. Does the five look anything like the tally for five?

4. How is the five used to make the four and the six?

The four is one less than five. Six is one more than five. What is seven? eight? nine?

5. The nine changes. It is not written as one more than eight, but one less than ten.

6. V and X are base letters. The mark I before V or X means one less than V or X. A mark of I to the right of V or X means one more than V or X.

7. Twenty is two tens. See how it is made. Add I to make twenty-one.

a. How would you make twenty-two? twenty-four?

b. Try to make thirty-one; twenty-nine.

1	one	I
2	two	II
3	three	III
4	four	IV
5	five	V
6	six	VI
7	seven	VII
8	eight	VIII
9	nine	IX
10	ten	X
11	eleven	XI
12	twelve	XII
13	thirteen	XIII
14	fourteen	XIV
15	fifteen	XV
16	sixteen	XVI
17	seventeen	XVII
18	eighteen	XVIII
19	nineteen	XIX
20	twenty	XX
21	twenty-one	XXI
30	thirty	XXX

8. Write the Roman numerals to XXX without help.

Read the first two questions on page 270.

USING ROMAN NUMERALS

1. Look at books at home until you find one that uses Roman numerals for chapter numbers. Do you find many?

2. What is the largest number of chapters that anyone in the class finds in a book?

3. Roman numerals are not often used for large numbers. They are not easy to use for large numbers.

Read these Roman numbers:

a	b	c	d	e	f	g	h	i
III	VII	XI	IV	XVII	XII	XIV	XX	XIX

4. Try to do these:

ADD	SUBTRACT	MULTIPLY
XVI	XXIII	XIV
VII	IX	VIII
XXI		

Now do these:

ADD	SUBTRACT	MULTIPLY
16	23	14
7	9	8
21		

Do you see why the Romans used an abacus for figuring?

5. Each digit in our number system has its own value and also has **place value.** The same digit can mean ones in one place and tens in another place. It can also stand for hundreds and thousands, and so on. Read 4444.

This tens system is called a **decimal** system.

6. Write these Roman numbers with our digits:

I	X	III	VI	VIII	IV	II	XII	IX

7. Write the numbers from 1 through 12 in Roman numerals.

LARGER PLACE VALUES

PLACE VALUES

Thousands	Hundreds	Tens	Ones
2	2	2	2

1. The number 2222 has how many places?

What is the place called in (**a**) and in (**b**) which is colored?

a. 2222 **b.** 2222

2. What is the value of this checked three? → $3333^{\surd}$

What is the value of this checked three? → $33\overset{\surd}{3}3$

What is the value of this checked three? → $3\overset{\surd}{3}33$

What is the value of this checked three? → $\overset{\surd}{3}333$

3. How many ones does this digit stand for? → 3

Is 30 ten times as many as 3? 30

Is 300 ten times as many as 30? 300

Three thousand is ten times as many as three hundred. Add ten 300's. Is the sum 3000? 3000

4.

5	50	500
$\times 10$	$\times 10$	$\times 10$

How does each number above change when it is multiplied by 10? Does it have another zero on its right?

Can you make a rule for multiplying by 10?

Use your rule to find 10×2; 10×4; 10×20; 10×40.

5. In which of these numbers is the 4 worth most?

a. 684 **b.** 471 **c.** 942 **d.** 4101

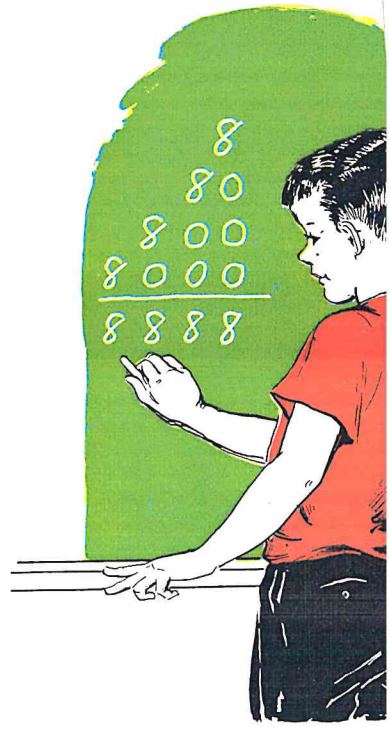
6. In which of these numbers is the 2 worth least?

a. 2134 **b.** 921 **c.** 482 **d.** 271

7. If you change each 3 to a 4, how much larger will each of these numbers become?

a. 213 **b.** 138 **c.** 356 **d.** 3178

READING AND WRITING THOUSANDS



Jim has learned to keep the columns straight. He knows that the column tells the value of a digit.

eight → 8
10 × 8 is eighty → 80
10 × 80 is eight hundred → 800
10 × 800 is eight thousand → 8000

1. We write thousands this way:

Three thousand	3000
Seven thousand	7000
Five thousand	5000
Nine thousand	9000

2. Twelve thousand is written this way: 12,000

A number which has as many as five places is hard to read. You almost have to count the places to be sure. So commas are used to make large numbers easy to read. Read these numbers:

12,000	4560	8225	9010	45,380
22,384	3000	4017	5006	31,205

Do not say **and** as you read numbers like those above. Five thousand **and** four hundred means: 5000 and 400. But five thousand, four hundred means: 5400.

3. Write these numbers:

Six thousand, fifty-two	Two thousand, one hundred ten
Four thousand, two	Six hundred sixty-nine
Five thousand, twelve	Nine thousand, nine
Six hundred thirty-five	Sixteen hundred fifty-two

ADDING LARGE NUMBERS

TRAIN DISTANCES

Jack lives in New York City. He and his mother are travelling to Los Angeles by train.

"How far is it to Los Angeles, Mother?" he asked. "I don't know," said Mother; "let's figure it."

1. "It is 2226 miles from Chicago to Los Angeles. From New York to Chicago is 907 miles. How far is that all together? You carry to thousands' place just as you carry to hundreds' or tens'."

```
 1 1
2226
 907
3133
```

2. "Is the distance about the same by all railroads?" asked Jack. "We'll see," said Mother. "By this other railroad it is 435 miles to Buffalo, and 535 miles from Buffalo to Chicago. It is 2299 miles to Los Angeles from Chicago. How far is that all together?"

```
 1 1 1
  435
  535
 2299
 3269
```

3. Which way is shorter? How much shorter? Is it sometimes better to go a longer way around mountains?

HOW LONG? HOW FAST? HOW FAR?

1. How far will John go in 2 hours if he rides his bicycle at a speed of 6 miles each hour?

How fast ? → 6
How long ? → x 2
How far ? → ?

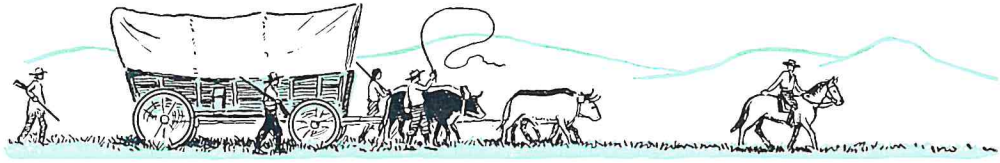
2. How far will Helen's dad go in 3 hours at a speed of 40 miles each hour? Think: "How many miles each hour? How many hours?"

How far ? → 6

3. How fast did the Scouts walk? They went 6 miles in 3 hours. How many miles an hour is that?

How long ? → 3
How fast ? → $3\overline{)6}$ 2

4. A covered wagon went 100 miles in 5 days. How many miles a day did it go?



5. About how many hours will it take Jim to ride his bicycle 10 miles? He rides at an average speed of 5 miles an hour.

$5\overline{)10}$ 2 ← How long?
← How far?
← How fast?

6. About how long will it take a group of boys to hike a trail of 4 miles? They hike at the rate (speed) of 2 miles an hour.

7. The time it takes you to go three miles depends on what?

8. The distance you go, riding 40 miles an hour, depends on what?

9. If all the boys and girls in your room start home at the same time and walk at the same speed, who will get home first? Why?

DIVIDEND, DIVISOR, QUOTIENT RELATIONSHIPS

1. How many pencils can Betty buy for 20¢?

COST OF EACH PENCIL)	NUMBER OF PENCILS
	20¢

a. How many if they cost 2¢ each? $2\overline{)20}$

b. How many if they cost 4¢ each? $4\overline{)20}$

c. How many if they cost 5¢ each? $5\overline{)20}$

d. How many if they cost 10¢ each? $10\overline{)20}$

What happens as the cost of each pencil increases?

2. Bob has 10¢ to spend for candy, Bill has 20¢, Jack has 25¢, and Dale has 40¢. How many 5-cent bars can each boy buy?

What happens if the cost is the same, but the amount to spend changes? $5\overline{)10}$ $5\overline{)25}$ $5\overline{)20}$ $5\overline{)40}$

PRACTICE

Copy and divide:

	a	b	c	d	e	f	g
1.	$5\overline{)13}$	$7\overline{)25}$	$9\overline{)83}$	$5\overline{)29}$	$3\overline{)14}$	$6\overline{)35}$	$5\overline{)21}$
2.	$6\overline{)180}$	$5\overline{)150}$	$4\overline{)120}$	$9\overline{)270}$	$5\overline{)350}$	$4\overline{)160}$	$6\overline{)240}$
3.	$9\overline{)729}$	$8\overline{)328}$	$3\overline{)189}$	$9\overline{)459}$	$6\overline{)366}$	$8\overline{)248}$	$7\overline{)287}$
4.	$6\overline{)487}$	$4\overline{)249}$	$5\overline{)407}$	$6\overline{)547}$	$7\overline{)569}$	$4\overline{)329}$	$8\overline{)649}$
5.	$9\overline{)558}$	$7\overline{)448}$	$8\overline{)504}$	$9\overline{)423}$	$8\overline{)600}$	$7\overline{)679}$	$6\overline{)474}$

SUBTRACTING LARGE NUMBERS

AIRLINE DISTANCES

Here is a table of airline distances from New York City.

MILES FROM NEW YORK CITY TO	
Atlanta	748
Berlin	3965
Denver	1631
London	3465
Miami	1092
Minneapolis	1018
New Orleans	1171
Omaha	1144
Paris	3600
San Francisco	2571
St. Louis	875

1. How much farther from New York is Berlin than London? is Berlin than Paris?

2. San Francisco is how much farther from New York than is Denver?

3. What is the difference in distance from New York to Omaha and New York to Denver?

4. St. Louis is how much closer to New York City than is Minneapolis?

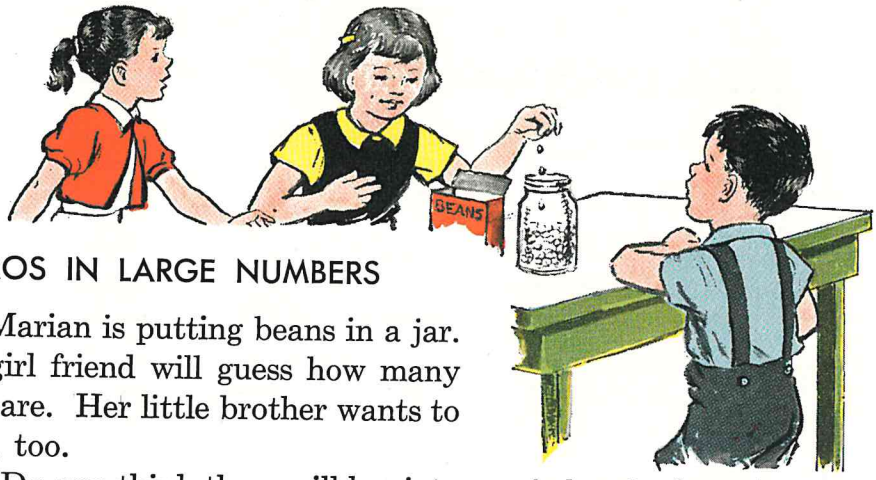
5. How much farther from New York City is Miami than is Atlanta?

6. Is Omaha, New Orleans, or Miami closest to New York City? By how many miles?

PRACTICE

Add the first and third rows; subtract the middle row.

(1)	(2)	(3)	(4)	(5)	(6)
2369	1749	5867	2765	1576	3847
6763	7678	3659	5589	6778	9789
(7)	(8)	(9)	(10)	(11)	(12)
9353	3237	8625	6563	9745	9846
3759	2768	4936	5974	5758	2989
(13)	(14)	(15)	(16)	(17)	(18)
7849	573	7479	6568	1457	846
4355	7939	3867	895	8639	5884
3408	8793	5676	6957	909	6877



ZEROS IN LARGE NUMBERS

Marian is putting beans in a jar. Her girl friend will guess how many there are. Her little brother wants to guess, too.

"Do you think there will be sixty, or six hundred, or six thousand?" she asked him.

Do you think any of the numbers above will be exactly right?

A six followed by one zero means sixty. 60
A six followed by two zeros means six hundred. 600
A six followed by three zeros means six thousand. 6000

1. There are different ways to think of numbers. How do you think of 2008?

Sam says, "Two thousand, eight." 2008
Peg says, "Twenty hundreds, eight ones." 2008
Doris says, "Two hundred tens, eight ones." 2008

2. Tell different ways to think of each number:
1405 4006 1600 3000 2500

3. Add six thousand and three thousand.
4. Add three hundred and four thousand.
5. Add thirty-six and five thousand.
6. Add three thousand and twelve hundred.
7. Subtract two thousand from five thousand.
8. Subtract four hundred from two thousand.
9. Subtract fifty from three thousand.
10. Subtract sixteen hundred from three thousand.

SUBTRACTING WITH MORE THAN ONE ZERO

Marian has counted 3006 beans for her guessing jar. She thinks it will be more fun to have two jars and two winners. She is going to put the beans into two smaller jars of different sizes. It took her a long time to count the 3006 beans.

How can she save time?

1. Which jar would you count first?

2. Marian counted 998 beans for the smaller jar. How many will be left for the other jar?

$$\begin{array}{r} 3006 \\ -\ 998 \\ \hline \end{array}$$

8 is more than 6. So change a ten to ones. Where do you find a ten to change?

There are 300 tens in 3006.

Take 1 ten and you have 299 tens left. Now you have 16 ones. You can subtract easily.

$$\begin{array}{r} {\scriptstyle 2\,9\,9\,,} \\ 3\,0\,\not{0}\,6 \\ -\ 9\,9\,8 \\ \hline 2\,0\,0\,8 \end{array}$$

3. Marian has not finished yet. She tries to pour the 2008 beans into the other jar. It holds all but 99. How many beans are in the bigger jar? Subtract 99 from 2008.

How many tens are in 2008?

Write this example on your paper:

$$\begin{array}{r} 2008 \\ -\ 99 \\ \hline \end{array}$$

Use 1 ten from 200 tens to change the 8 to 18.

Take 9 from 18.

Take the other 9 from 199.

4. Copy and subtract:

a.	**b.**	**c.**	**d.**	**e.**
6004	2003	1006	7002	4005
5239	684	998	5007	3198

▶ MULTIPLYING THOUSANDS

1. Joe wonders how long it will take to use all the paper he sees.

First we shall have to find out how much paper there is. See if, without help, you can find the number of sheets.

2. Joe learned that 1 ream of paper is 500 sheets.

"There are 6 stacks with 4 reams in each," he said. How many reams is that in all?

George divides. Every 2 reams is a thousand sheets. Dividing 24 by 2 gives 12 thousands.

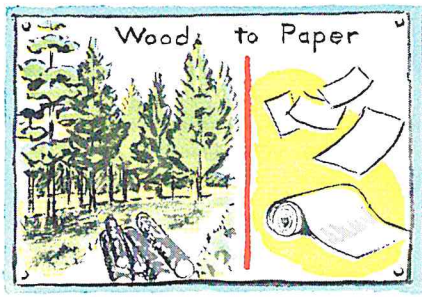
Joe says you multiply to find the number of sheets, but he doesn't know how with such large numbers.

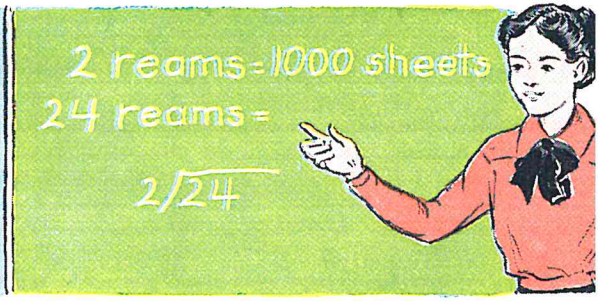
Don says, "There are 2000 in each of 6 stacks. Just multiply 2000 sheets by 6."

You multiply 2 thousands the same way you multiply 2 tens or 2 hundreds, but the answer will be thousands.

3. Multiply:

a	b	c	d	e	f	g
500	1000	2000	5000	4000	3000	6000
6	8	4	5	6	5	5





THINKING ABOUT THOUSANDS (Enrichment)

1. "How many reams of paper were in the cabinet?" asked Mrs. Brown. "Twenty-four," said Joe.

"It takes how many reams to make 1000 sheets?"

"Two," said Joe. Was he right?

2. "There are about 500 children in our school," said Mrs. Brown. "How long will it take them to use 12,000 sheets, which is 24 reams?"

Is there an easy way to think about this problem? Here are some hints:

First idea. If each child uses one sheet in one day, how many reams will that take for 500 pupils?

Second idea. If each child uses one sheet a day, how many days will it take for all the pupils to use 1000 sheets?

What is the answer?

3. Suppose each child uses one sheet of paper each day. How long will it take—

a. 500 children to use 500 sheets?
b. 500 children to use 1 ream?
c. 500 children to use 1000 sheets?
d. 500 children to use 5000 sheets?
e. 1000 children to use 10 reams?
f. 500 children to use 6 reams?
g. 1000 children to use 6 reams?
h. 100 children to use 1000 sheets?
i. 100 children to use 10,000 sheets?

CARRYING WHEN MULTIPLYING THOUSANDS

1. You have already learned to carry in multiplication. Explain what was done in the example at the right.

$$\begin{array}{r} 467 \\ \times\ 6 \\ \hline 2802 \end{array}$$

2. Multiply 2500 by 3. How many are 3 zeros?
Three fives are how many?
Three twos are 6, and 1 to carry makes 7.

$$\begin{array}{r} 2500 \\ \times\ 3 \\ \hline 7500 \end{array}$$

3. Watch the zeros:

$$\begin{array}{r} 2600 \\ \times\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 2360 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 5400 \\ \times\ 2 \\ \hline \end{array}$$

4. Carry twice in these:

$$\begin{array}{r} 2580 \\ \times\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 3460 \\ \times\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 2560 \\ \times\ 3 \\ \hline \end{array}$$

Look at these multiplications. In what way are they different?

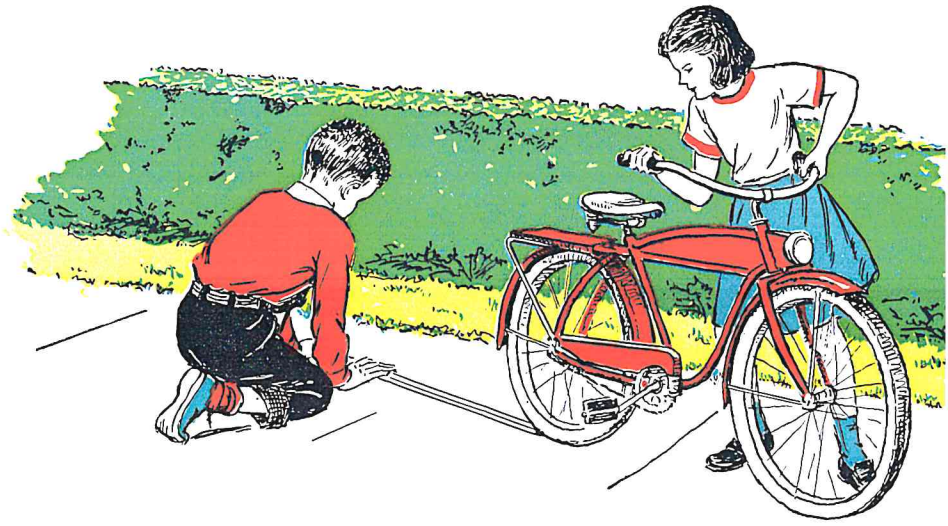
- As the multiplicand becomes larger and the multiplier stays the same, the product _____ _____.

$$\begin{array}{r} 24 \\ \times\ 3 \\ \hline 72 \end{array} \qquad \begin{array}{r} 240 \\ \times\ 3 \\ \hline 720 \end{array} \qquad \begin{array}{r} 2400 \\ \times\ 3 \\ \hline 7200 \end{array}$$

- If the multiplicand becomes ten times as large and the multiplier stays the same, does the product become ten times as large?

Copy and multiply:

1. 4230 × 2	**2.** 3120 × 4	**3.** 6450 × 3	**4.** 3460 × 4	**5.** 9680 × 4
6. 8970 × 3	**7.** 7680 × 5	**8.** 5790 × 6	**9.** 8590 × 2	**10.** 4800 × 6
11. 3620 × 8	**12.** 7940 × 5	**13.** 3720 × 7	**14.** 4530 × 9	**15.** 3750 × 4



DIVIDING THOUSANDS

1. Sally and Fred are trying to estimate how many times a bicycle wheel turns in a mile.

"Every time it turns," said Fred, "it goes about 6 feet. There are 5280 feet in a mile, so divide 5280 by 6."

2. How can you divide 5280 by 6? There are not 6 thousands, so you divide 52 hundreds.

How many sixes are in 52? Write 8 in the hundreds' place. $8 \times 6 = 48$.

Take 48 from 52 and 4 are left over. You now have 480, or 48 tens, left over.

Now divide the tens. $48 \div 6 = 8$ tens.

There are no ones left. Write 0 in ones' place.

$$\begin{array}{r} 880 \\ 6\overline{)5280} \\ \underline{48} \\ \text{tens} \rightarrow 48 \\ \underline{48} \\ 0 \end{array}$$

- You divide thousands as you divide hundreds.

PRACTICE

	a	b	c	d	e
1.	$4\overline{)5428}$	$3\overline{)8292}$	$2\overline{)5374}$	$5\overline{)2315}$	$3\overline{)5505}$
2.	$6\overline{)3726}$	$8\overline{)3456}$	$5\overline{)4685}$	$9\overline{)2178}$	$7\overline{)3024}$
3.	$5\overline{)4245}$	$9\overline{)3204}$	$7\overline{)4795}$	$6\overline{)2294}$	$8\overline{)2736}$

UNIT TEST

Set 1. Meaning

1. Write these Roman numerals with digits:

a. VII **b.** IV **c.** XIV **d.** XXVI **e.** XXIX

2. What digit is in hundreds' place in 4765?

3. What digit is in thousands' place in 6842?

4. Write **six thousand, seventy** with digits.

5. Add **eight thousand, four hundred six** to **fifteen hundred thirty.**

6. What does the distance a person may go in three hours depend on?

7. Is the distance in miles from New York City to San Francisco nearer 1500 or 2500 mi.? (See page 276.)

8. Write the sum of **three hundred** and **three thousand.**

9. How many are ten hundreds?

Without multiplying, tell which number in each row will have the largest product:

10. **a.** 6×780 **b.** 6×78 **c.** $6 \times 78{,}000$ **d.** 6×7800

11. **a.** 4×352 **b.** 7×352 **c.** 9×352 **d.** 8×352

12. **a.** 7×431 **b.** 7×526 **c.** 7×239 **d.** 7×527

Set 2. Multiplication and Division

1. 6270 × 3	**2.** 3580 × 5	**3.** 3640 × 9	**4.** 4250 × 7	**5.** 8470 × 6
6. 2405 × 8	**7.** 9350 × 7	**8.** 8360 × 4	**9.** 8570 × 9	**10.** 7630 × 8

11. $3\overline{)1455}$	**12.** $5\overline{)2420}$	**13.** $8\overline{)1752}$	**14.** $6\overline{)1974}$
15. $9\overline{)1881}$	**16.** $7\overline{)4347}$	**17.** $4\overline{)3700}$	**18.** $9\overline{)4824}$

UNIT 26

THINKING ABOUT PROBLEMS

DOLLS FROM FARAWAY LANDS

Marilyn's Brownie group promised to dress some dolls for a doll show in clothes of other countries. Marilyn's mother is helping the girls. Here are some of their problems:

1. The girls have $10.00 to spend. They plan to dress four dolls. What is the average amount they can spend for each doll?

Tell the problem in your own words.

2. "How many days do we have to make clothes for each doll?" asked Marilyn's mother. "The doll show is two weeks from Friday, and this is Tuesday."

What is the question? What are you told?

3. "We can't get the cloth till Saturday," said her mother. "I think we can finish if we start Monday." How many days will that leave for them to work? They must be ready two weeks from Tuesday.

What is asked? What is told? What do you do?

▶ READING A TABLE

Most of the dolls are in Karen's collection.

Jim and Harry found out how far away the dolls' countries are.

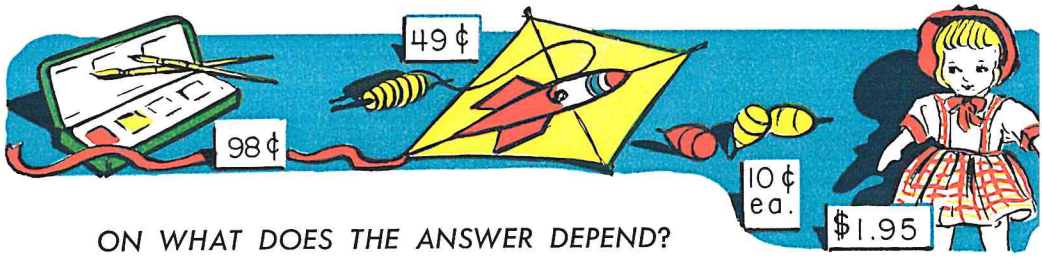
The children now know these things about some of the dolls:

Doll's Name	Country	Cost	When Karen Got Them	Miles to Their Homes
MARIA	Spain	$4.75	Dec., 1953	4000
ANNETTE	France	3.50	July, 1952	4100
MARYAM	India	4.25	Dec., 1953	8000
HANA	Japan	3.75	Dec., 1952	6300
THERESA	Turkey	4.00	Dec., 1953	5500
OLGA	Sweden	4.50	Dec., 1952	4400
PEDRO	Mexico	4.25	July, 1954	1200

1. What is the name of the doll from Mexico?
2. In which year did Karen get Olga?
3. Which doll has she had longest?
4. Which doll did she get last?
5. Which doll cost the most? the least?
6. How many dolls cost less than $4.00 each?
7. Which doll's homeland is farthest away?
8. How many dolls did Karen get in 1952?
9. How would you find what all the dolls cost?
10. How would you find the difference between the highest cost and the lowest cost?

PRACTICE

1.	2.	3.	4.	5.	6.
$4.75	$4.35	$0.48	$5.69	$5.58	$6.67
6.79	7.96	7.95	6.76	3.99	0.68
3.87	0.80	8.75	9.86	4.55	4.89



ON WHAT DOES THE ANSWER DEPEND?

1. You want to know what several toys cost. Do you need to know the number of toys? Do you need to know the cost of each toy?

2. Will 15 readers be enough for one reading group? The answer depends on what?

3. You want to know how much a person has grown in height in a year. You know he is 4 ft. 8 in. tall now. On what does the answer depend?

4. You want to know how many cars will be needed to take 30 children to visit a dairy farm. On what does the answer depend?

5. You want to know how many boys and girls can eat in a school lunchroom at one time. You know how many can eat at each table. On what else does the answer depend?

6. You want to know each child's share of the cost of a picnic. You know the total cost. What else do you need to know?

7. How many hours will it take to go to the seashore if it takes 3 hours to go every hundred miles? On what else does the answer depend?

8. You want to know if you have enough money to buy a bicycle horn. On what two facts does the answer depend?

9. You want to know how long you have been playing at your friend's house. On what two facts does the answer depend?

I want a ball for $1.50, a horn for $1.20, a space gun for $1.00, a knife for 10¢, a hammer for 70¢, bicycle grips for 90¢, a dozen pencils for 50¢, a ruler marked with tenths of an inch for 0¢, a flashlight for 80¢, and two batteries for 20¢.

DOES A LIST HELP?

Jim knows he can't have all of these things for his birthday. He will be happy with one or two.

1. Which one costs the most?

2. Which four things can be bought for $1.50 plus sales tax?

3. Which two things cost the same?

Jim's dad said, "If you make a list, Jim, it will be easier for me to think about what you want."

Jim made the list at the right for his dad.

4. Now ask Questions *1*, *2*, and *3* above, about the list. Is it easier to think about the questions?

5. In which list is the information easier to use?

6. Do not add the costs. What do you estimate will be nearest the total cost? $100 $20 $5 $3

7. What groups of things could Jim get for about $2.00? for $3.00?

8. Make a list of things that girls might want for their birthdays, or of things boys might want.

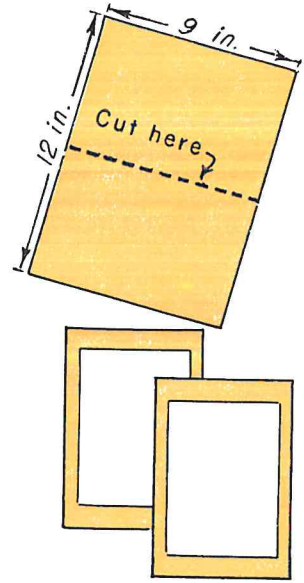
For My Birthday	
ball	$1.50
horn	1.20
space gun	1.00
knife	.10
hammer	.70
bicycle grips	.90
dozen pencils	.50
ruler, marked in tenths of an inch	.10
flashlight	.80
batteries	.20

THINKING PROBLEMS FOR MOTHER'S DAY

(If you do not have paper to cut for these problems, draw them as you read the page.)

"Mother's Day will be on May 12 this year," said Mrs. Smith. "Today is April 26. Would you like to write letters to your mothers?"

All the children wanted to write letters, so Mrs. Smith helped them plan. They decided to use two kinds of paper. They planned to write on white paper and paste it on blue paper.



1. "We shall cut sheets of blue paper into two equal parts. The sheets are 9 inches wide and 12 inches long. How large will the sheets be after we cut them like this drawing?" asked Mrs. Smith.

2. "Then we shall take the half sheet of blue and paste the white sheet to it. We'll leave a half-inch space at each side and an inch at each end. How large will the white writing paper be?"

3. How many pieces of white paper 5 inches wide and 7 inches long can be cut from a piece that is $8\frac{1}{2}$ inches wide and 11 inches long?

4. One piece of blue paper 9 inches wide and 12 inches long will be enough for how many letters? Remember that the small blue sheet is 6 inches wide and 9 inches long.

5. The letters are to be folded once, across the short way, to look like envelopes. How many inches wide and how many inches long will the letters be when folded?

MAKING INVITATIONS — TWO QUESTIONS

1. Fold a sheet of paper 9 in. by 12 in. (this means 9 inches wide and 12 inches long) across the short way. Then fold it again the short way. What size is the folded sheet? How long will it be then?

2. Can you get three sheets or two sheets of paper 5 in. by 7 in. from a piece of paper that is 9 in. by 12 in.? How can you find this out? Could you do it without numbers? Draw a picture to help you think about it.

3. There are 36 children in a class. Each one needs a piece of paper that is 6 inches wide and 9 inches long. How many sheets 9 in. by 12 in. will be needed for all?

4. A package of the blue paper has 36 sheets and costs 72¢. If two children use one sheet, about how much will the cost be for each child? About 12¢, 6¢, 3¢, 2¢, or 1¢?

5. The paper for 36 invitations costs 50¢. A stamp for each child costs 3¢. How much will 36 stamps cost? How much will both paper and stamps cost?

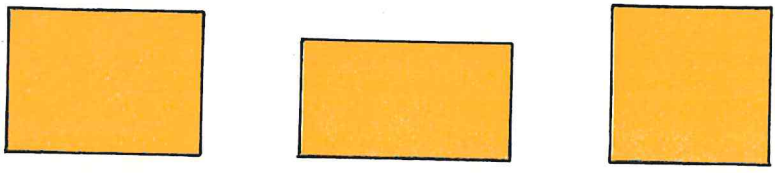
PRACTICE

Copy and divide:

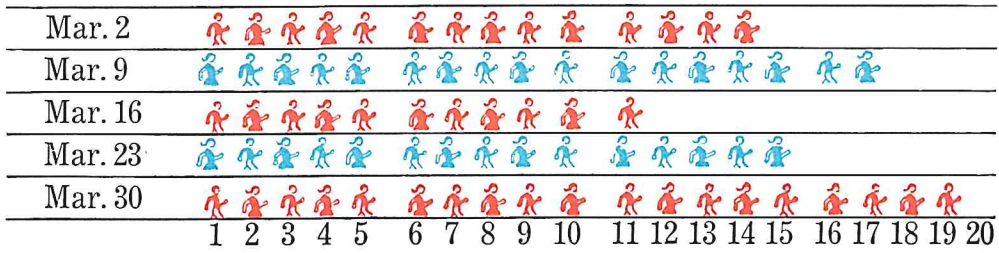
1. $4\overline{)328}$ **2.** $3\overline{)90}$ **3.** $7\overline{)30}$ **4.** $6\overline{)41}$ **5.** $3\overline{)72}$ **6.** $9\overline{)216}$

7. $2\overline{)43}$ **8.** $3\overline{)85}$ **9.** $4\overline{)193}$ **10.** $3\overline{)1200}$ **11.** $2\overline{)506}$ **12.** $2\overline{)624}$

Which of these shapes do you like best?



NUMBER OF PUPILS WITH ALL SPELLING WORDS RIGHT



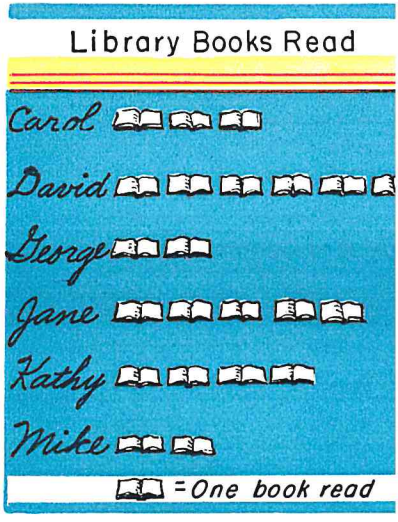
PICTURES OF NUMBERS

1. Which week did most children spell all the words right? How many had the words all right that week?

2. Which week did fewest children have all the words right? How many had all the words right that week?

3. How many children had all the words right the week of March 2? the week of March 9?

Last summer six children in our school joined the summer book club at the library. Each time that a child told the librarian about a book he read, she marked his chart record.



4. Who read the most books?

5. Who read the fewest?

6. Who tied for number read?

7. How many did Jane read?

8. How many read more than Jane?

9. How many read more than Kathy?

10. How many read as many as 3 books? Who read most?

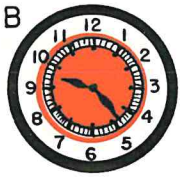
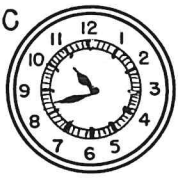
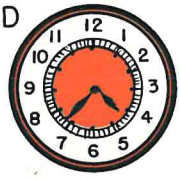
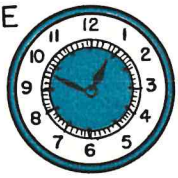
11. Do pictures of numbers help find answers?

HOW WELL DO YOU KNOW?

Write the answers for Ex. 1 through 17. How many:

1. inches in a foot?
2. quarts in a gallon?
3. cents in a quarter?
4. minutes in an hour?
5. nickels in a dollar?
6. hours in a day?
7. buns in a dozen?
8. pints in a quart?
9. dimes in a half dollar?
10. feet in a yard?
11. days in a week?
12. inches in a yard?
13. quarters in a dollar?
14. seconds in a minute?
15. ounces in a pound of meat?
16. half pints in a pint?

17. Write the time of each clock to the minute:

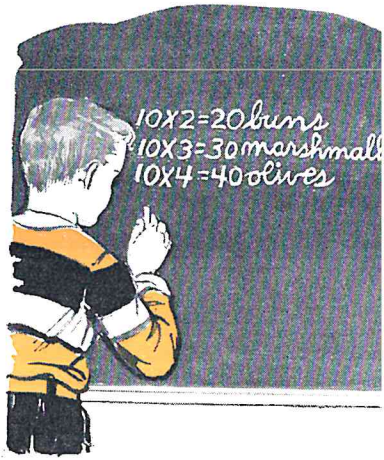
A B  C  D  E 

PRACTICE

Multiply the second row; subtract the third row.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
6)426	9)387	5)435	7)483	4)344	8)768	3)207
(8)	(9)	(10)	(11)	(12)	(13)	(14)
836	586	647	849	857	748	847
4	5	9	6	8	3	7
(15)	(16)	(17)	(18)	(19)	(20)	(21)
1730	1422	1391	111	563	1656	645
893	524	894	49	468	769	557
(22)	(23)	(24)	(25)	(26)	(27)	(28)
45	446	779	447	574	534	574
746	873	754	279	849	223	365
309	965	967	985	675	698	788

MULTIPLYING BY TWO-PLACE NUMBERS



▶ MULTIPLYING BY TEN

Bill says he likes parties of ten people because it is so easy to figure what is needed for them.

1. If each person in a party of 10 has 2 buns, how many will be needed?

2. If each of the 10 persons has 3 marshmallows, how many will be needed?

If each has 4 olives, how many will be needed?

3. How many twos of buns are there? How many buns? $10 \times 2 =$?

4. How many threes of marshmallows are there? $10 \times 3 =$?

5. How many fours of olives? How many olives? $10 \times 4 =$?

6. How do you multiply any number by 10?

7. If you write a number, as 8 or 12, and place a zero at its right side, as 8**0** or 12**0**, what have you done to the size of the number?

▶ Placing a zero to the right of any number makes the number ten times as large.

8. Multiply each of these numbers by 10:

6 8 2 12 15 10 14 20 50

MULTIPLYING BY A TEN AND ONES

1. How many eggs are 1 dozen? 2 dozen? 3 dozen?

2. Do 1×12 and 2×12 equal 3×12?

$1 \times 12 = 12$ $\qquad$ 12

$2 \times 12 = 24$ $\qquad$ $\times 3$

$\qquad\quad 36$ $\qquad$ 36

3. Do 2×12 and 2×12 equal 4×12?

$2 \times 12 = 24$ $\qquad$ 12

$2 \times 12 = 24$ $\qquad$ $\times 4$

4. How many are 12 dozen? Do 2×12 and 10×12 equal 12×12? →

$2 \times 12 = 24$

$10 \times 12 = 120$

144

5. Here is another way to multiply 12×12. →

12

$\times 12$

24

12

144

6. How many is 13×23?

23

$\times 13$

Multiply by the ones' digit. → 69

Multiply by the tens' digit. → 23

Start the tens' part of the answer in the tens' column.

Why do you not need to put a zero in ones' place to know where to start the tens' answer?

Add the parts of the answer to get the whole answer. →

23

$\times 13$

69

23

299

7. Explain how to do each multiplication below:

a.	**b.**	**c.**	**d.**	**e.**
12	15	25	24	20
13	12	12	15	16

MULTIPLYING BY MORE THAN ONE TEN

1. Jane's teacher wants paper cut into strips for writing spelling words. She asks Jane to cut 12 strips of paper for each of 30 children. How many strips should Jane cut?

Jane thinks: "30 × 12." She writes → 12 ×30

Jane's teacher says, "There are no ones to multiply by, so there will be no ones in the ones' place in the answer."

Jane writes zero in ones' place. Why? 12 ×30 360

She then multiplies by the tens' digit. Is her multiplication right?

Bob says, "I know the multiplication is right. 3 × 12 = 36, so 3 tens × 12 = 360."

Ted says, "10 × 12 = 120. 3 × 120 = 360. Jane's answer is right."

Jane says, "I will cut 360 strips of paper. That will be 12 for each of us."

2. How many strips of paper are needed for 30 pupils if each has 15 strips?

3. How many sheets of paper will make 360 strips if one sheet makes 3 strips?

4. Explain what happened in these multiplications:

a.	**b.**	**c.**	**d.**	**e.**	**f.**
16	14	21	35	20	12
20	40	30	50	30	80
320	560	630	1750	600	960

5. Multiply:

a.	**b.**	**c.**	**d.**	**e.**	**f.**	**g.**
15	12	14	16	15	30	23
10	30	12	40	15	10	14

h.	**i.**	**j.**	**k.**	**l.**	**m.**	**n.**
38	42	25	15	20	45	32
20	60	18	16	90	13	80

MULTIPLYING BY TENS AND ONES

1. Steve's job is to help Miss Scott order supplies for all of next month. There are 32 children in Steve's room. Each will need 19 sheets of paper for arithmetic. How many sheets should Steve write on his list?

Steve writes this multiplication. "I need 32 nineteens," says Steve.

```
   19
   32
```

Steve learned on page 293 that he first multiplies by the ones and then by the tens of the multiplier. He knows that he should start the ones' product in ones' place and the tens' product in tens' place.

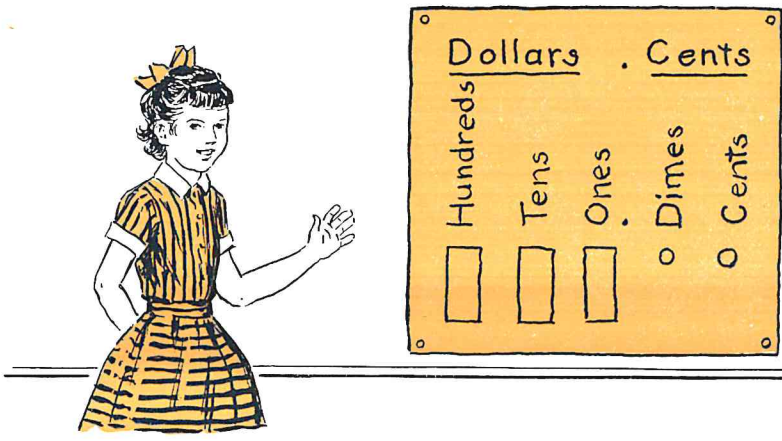
```
   19  ← multiplicand
   32  ← multiplier
   38  ← ones' product
  57   ← tens' product
  608  ← product
```

"Write good numbers and keep the columns straight," says Steve.

• **Partial product** is a name often used instead of **ones' product** or **tens' product.**

2. The children are planning a school garden again. How many plants will they need to get? Here is their list:

a. Tomatoes: 20 rows of 16 plants in each.
b. Cabbage: 24 rows of 16 plants in each.
c. Head lettuce: 10 rows of 28 plants in each.
d. Flowers: 12 plants in each of 15 rows.
e. Sweet potatoes: 20 plants in each of 20 rows.



OUR MONEY IS A TENS SYSTEM

Our money system is a tens system. A tens system is a decimal system.

Jane made an interesting discovery. "The money measures are just like numbers," she said. "I discovered that if you take some of the coins and bills of our money system, you can make a tens system. I really didn't see a $100 bill, though. But there are some."

1. List all the coins and bills in order. Mark those that make a system of tens.

What coin or bill is worth ten times as much as a cent? as a dime? as a dollar? as a ten-dollar bill? Is there a thousand-dollar bill?

2. What is the smallest number of coins and bills that will make the amount of $111.11?

3. Look at the names on our coins. Can you find the word penny or nickel on a coin?

a. Is **one dime** or **ten cents** the real name for a coin?
b. What is the real name for a **penny?** for a **nickel?**
c. Is **quarter** a real name? Look at the coin.
d. Do you usually say a **half** or a **half dollar?**
e. Why do you think **five cents** is called a nickel?

MULTIPLYING MONEY BY TEN

1. Susan's dad brought home 10 pencils. At 5¢ each, how much will 10 pencils cost?

What is the easy way to multiply by 10?

2. A show ticket costs 50¢. How much will 10 tickets cost? Write the amount.

3. It costs $5.00 to buy the kind of kickball we use. How much will 10 kickballs cost? Write the amount.

4. A storekeeper has bicycles for sale at $50 each. He has sold 10 of them this year. How much money did all 10 bicycles sell for? Write the amount.

5. Here are the multiplications you have made above:

(1)	(2)	(3)	(4)	
$0.05	$0.50	$5.00	$50.00	← multiplicands
10	10	10	10	← multiplier
$0.50	$5.00	$50.00	$500.00	← products

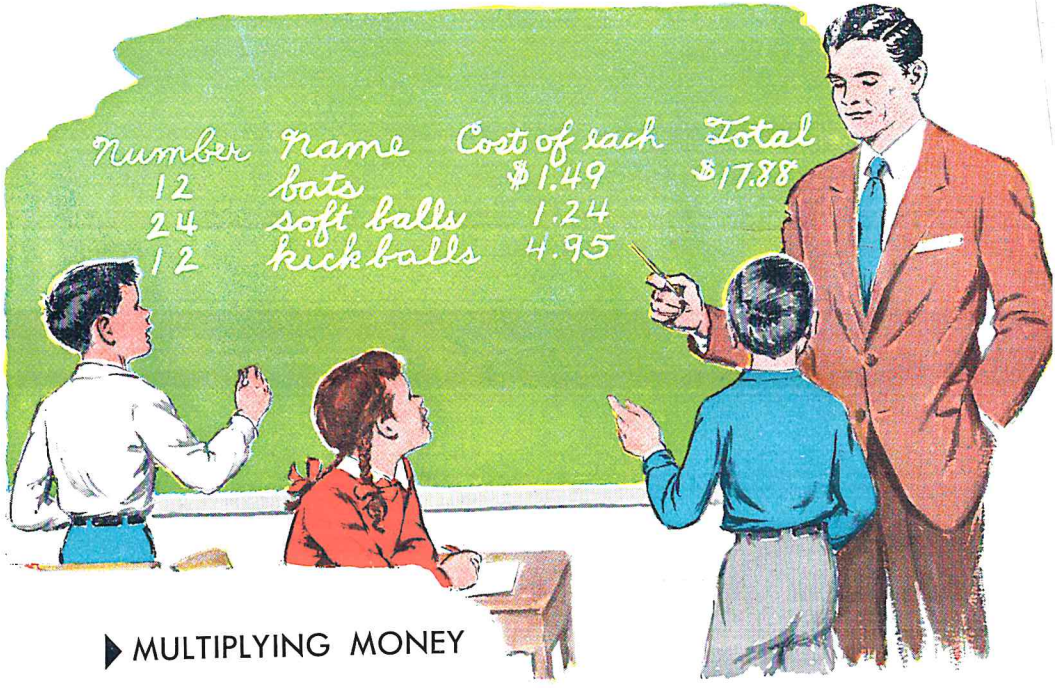
Look at the place of the 5 in each multiplicand and in each product.

What happens to the place values in a number when you make the number 10 times as large?

PRACTICE

Find the products:

1. 234 × 12	**2.** 314 × 22	**3.** 213 × 32	**4.** 312 × 42	**5.** 743 × 21	**6.** 142 × 16
7. 153 × 25	**8.** 234 × 42	**9.** 423 × 28	**10.** 254 × 77	**11.** 281 × 19	**12.** 574 × 31
3. 342 × 82	**14.** 264 × 34	**15.** 912 × 29	**16.** 253 × 72	**17.** 829 × 23	**18.** 435 × 99



MULTIPLYING MONEY

SCHOOL SUPPLIES

Mr. Burk, the principal, asked three children to help make out an order for playground supplies for next year. Jim has written part of the order on the chalkboard.

The part for bats is done below to show how to find the cost of all of them.

$$\begin{array}{r} \$1.49 \\ \times \quad 12 \\ \hline 298 \\ 149 \\ \hline \$17.88 \end{array}$$

Do you first multiply by ones? Are there 2 ones? 2 times $1.49 gives a partial product of 298.

You wait till the end to put in the point that separates dollars and cents.

There is 1 ten in the multiplier. When you multiply by tens, start the answer in tens' column.

Why don't you need to write a zero in the partial product when you multiply by tens?

Be sure to put the point in the answer.

1. Find the total cost for the softballs.

2. Find the total cost for the kickballs.

HOW WELL HAVE YOU LEARNED?

1. Write the answers:

a. How many is 10×4? 10×8? 10×9?

b. How many is 10×12? 10×15? 10×25?

c. How many is 10×20? 10×50? 10×100?

d. How many is 20×2? 20×4? 20×6?

Copy and multiply:

	a	b	c	d	e	f	g	h
2.	13	19	24	38	16	28	34	26
	16	18	17	16	15	18	14	16
3.	17	46	27	49	27	26	54	38
	28	29	37	54	19	48	39	34

4. Check Rows *2* and *3* above by changing the multipliers and multiplicands around. Will 16 thirteens be the same as 13 sixteens?

• If a multiplier and a multiplicand change places, the product remains the same.

PRACTICE

Copy and multiply:

1. 324	**2.** 312	**3.** 621	**4.** 234	**5.** 319	**6.** 953
21	23	24	88	37	64
7. \$1.23	**8.** \$2.30	**9.** \$3.04	**10.** \$2.00	**11.** \$3.45	
12	12	12	12	12	
12. \$1.25	**13.** \$3.29	**14.** \$4.15	**15.** \$6.28	**16.** \$2.37	
12	25	57	75	46	

CLINCHING YOUR LEARNING

▶ OUR DECIMAL SYSTEM

1. A ten is how many ones?

2. A hundred is how many tens?

3. A thousand equals how many hundreds?

4. Tens made 10 times as large become _?_.

5. Hundreds made 10 times as large become _?_.

6. $10 \times 1 =$ _?_ $10 \times 10 =$ _?_ $10 \times 10 \times 10 =$ _?_

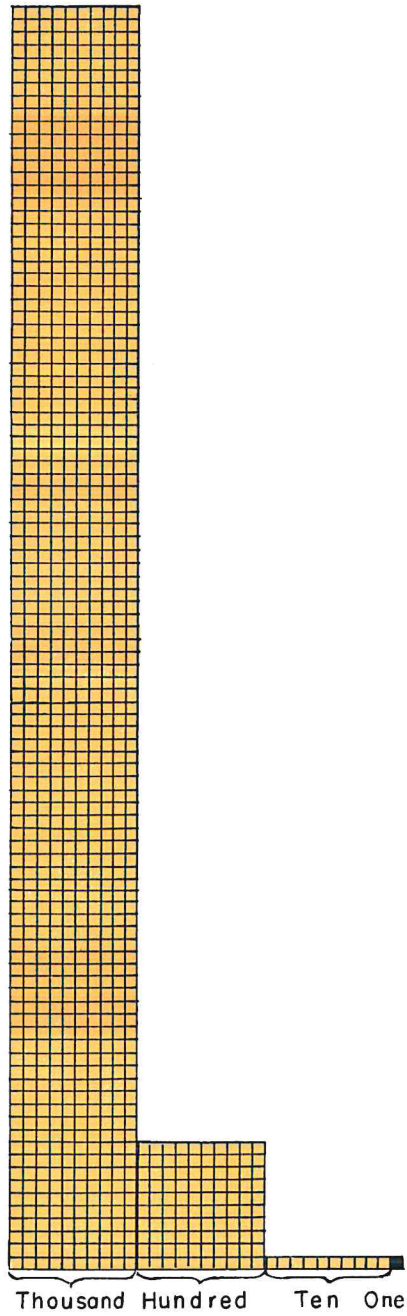
7. Read these numbers:

684 709 5032

8. Which is largest?

909 878 1241 99

9. Each of the ones in the number **$1,111.00** stands for a bill of paper money. Which bill would you choose if you could have one of them?



PRACTICE

Set 1

Do you understand place value of digits?

1. Which is smallest? 701 202 99 101

2. Which is largest? 99 198 399 511

3. Which is odd? 36 66 336 63

4. Which is even? 74 47 147 447

5. Which digit in 3582 is worth most?

6. Which digit in 4718 is worth least?

7. Which number is five thousand, three?

a. 50003 **b.** 503 **c.** 5003 **d.** 5300

Set 2

How fast can you add? Use folded paper.

1.	9	7	2	5	6	3	4	3	6	8
	2	7	4	3	6	7	5	2	5	2
2.	4	2	5	2	9	5	2	3	7	3
	3	9	4	3	9	2	8	4	2	8
3.	4	7	2	8	6	2	8	2	5	7
	2	4	6	8	4	5	3	7	6	3

Set 3

How fast can you subtract? Use folded paper.

1.	5	8	11	14	12	10	6	7	9	10
	3	7	6	7	8	9	2	5	4	2
2.	10	6	7	10	9	7	11	12	10	9
	7	4	2	8	2	4	5	4	6	7
3.	8	10	12	7	16	10	9	8	11	9
	5	4	9	3	8	3	5	6	2	3

EARNING MONEY NEXT SUMMER

What would you like to do next summer?

1. Dot and Jean want to sell lemonade. A dozen lemons at 5¢ each will make a gallon of lemonade. One pound of sugar at 9¢ will be enough sugar. How much will the gallon of lemonade cost?

What must you do first to answer this problem?

2. How many glasses of lemonade can be sold from a gallon? There are two glasses in a pint.

What question must you answer first?

3. If a glass of lemonade sells for 10¢, how much will 16 glasses sell for?

4. If a gallon of lemonade cost 69¢ to make, how many glasses at 10¢ each must be sold to pay for the cost of making the lemonade?

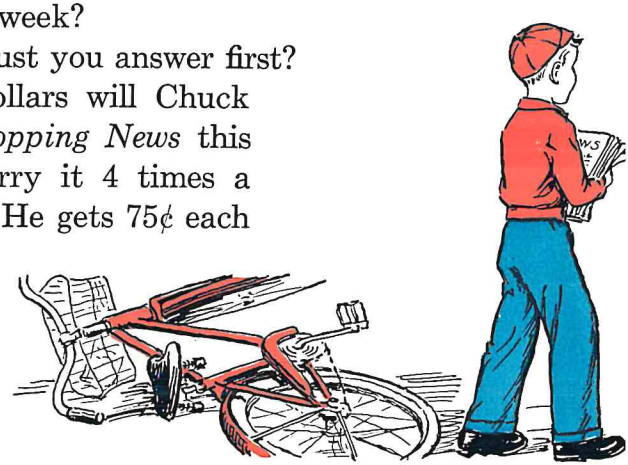
5. Dot and Jean sell 32 glasses of lemonade at 10¢ each. It costs $1.38 to make the lemonade. Mother gave them paper "glasses." How much money do they earn for themselves?

What question must you answer first?

6. Nancy helps care for the neighbors' two-year-old child five afternoons each week. Nancy gets 25¢ an hour. She works two hours in an afternoon. How much money does Nancy earn in a week?

What question must you answer first?

7. How many dollars will Chuck earn carrying the *Shopping News* this summer? He will carry it 4 times a month for 3 months. He gets 75¢ each time.



PRACTICE

Set 1

How fast can you add? Use folded paper.

1. 9	3	8	6	4	9	7	4	9	6
4	5	4	3	7	6	5	6	8	7
2. 3	7	5	8	9	8	6	4	6	9
9	8	9	7	3	5	9	8	2	5
3. 7	8	5	4	6	9	6	5	7	8
6	9	7	9	8	7	5	8	9	6

Set 2

How fast can you subtract? Use folded paper.

1. 13	11	12	8	18	9	15	8	14	16
6	8	5	3	9	6	7	2	9	7
2. 15	11	17	11	13	14	11	13	14	12
8	3	8	9	4	8	4	9	6	7
3. 14	17	11	13	12	16	13	15	13	15
5	9	7	8	3	9	7	6	5	9

Set 3. Addition

1. 836	**2.** 218	**3.** 727	**4.** 162	**5.** 386	**6.** 485
135	564	256	397	293	362
7. 387	**8.** 439	**9.** 846	**10.** 565	**11.** 688	**12.** 374
759	687	878	789	347	659

Set 4. Subtraction

1. 789	**2.** 198	**3.** 298	**4.** 847	**5.** 359	**6.** 129
253	73	262	663	82	95
7. 262	**8.** 364	**9.** 144	**10.** 482	**11.** 492	**12.** 823
97	279	85	345	468	686

WHAT DOES IT ASK? TELL? WHAT DO YOU DO?

There are many interesting things to do in summer vacation. After you work this page, make a problem about what you would like to do this summer.

1. Jack and Mike want to make a tent about 5 ft. high, like the one in the picture. About how many yards long must a canvas be to go over the rope? Each side is 6 ft. from the stake to the rope at the top.

What does the problem ask? What does it tell?

2. Jack stepped off the distance between two trees. "Six steps at about 2 ft. each," he said.

How many yards is that?

3. "I'll ride my bicycle a hundred miles this summer," said Don. "You can't," said Bob. Do you think Don can?

How many days are in June, July, and August?

If Don rides a mile every day, will he ride 100 miles in these three months? Is it easy to ride over a mile a day?

4. How many miles might he ride in a day?

5. Jim helps on the farm. He feeds three pens of chickens. He takes 2 quarts of mixed grain to one pen, a gallon to another, and a gallon and a half to the third pen. How many gallons of grain is this all together?

What does the problem ask? What do you do?

6. Sally is going to swim 100 yards a day. Her pool is 30 ft. long. How many round trips will she have to swim?

Tell about the problem in your own words.

FACTS OF 3'S THROUGH 9'S

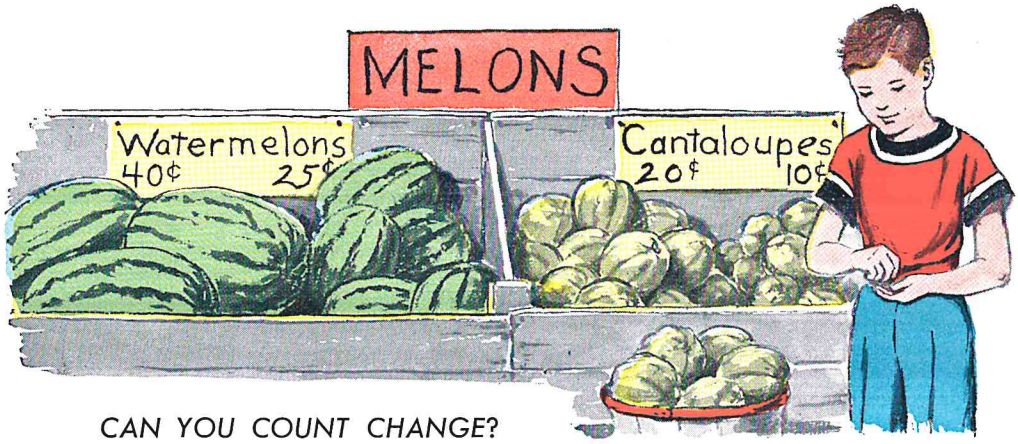
Multiply. Use folded paper.

	a	b	c	d	e	f	g	h	i	j
1.	3	5	6	4	3	4	5	6	4	3
	3	4	6	7	5	9	8	3	4	8
2.	7	4	5	7	6	5	3	7	3	4
	5	3	6	3	8	9	4	7	6	8
3.	6	9	4	3	5	4	8	7	3	9
	4	3	5	7	7	6	3	8	9	8
4.	5	9	8	7	8	6	9	8	9	7
	3	6	5	9	8	5	4	7	9	6
5.	8	6	5	9	8	9	7	8	6	
	4	9	5	7	6	5	4	9	7	

Divide. Use folded paper.

	a	b	c	d	e	f	g
6.	$6\overline{)18}$	$4\overline{)16}$	$3\overline{)24}$	$5\overline{)20}$	$3\overline{)9}$	$6\overline{)36}$	$4\overline{)28}$
7.	$3\overline{)15}$	$4\overline{)36}$	$5\overline{)40}$	$7\overline{)49}$	$3\overline{)18}$	$4\overline{)32}$	$7\overline{)35}$
8.	$4\overline{)12}$	$5\overline{)30}$	$7\overline{)21}$	$6\overline{)48}$	$5\overline{)45}$	$3\overline{)12}$	$7\overline{)56}$
9.	$3\overline{)9}$	$9\overline{)72}$	$6\overline{)24}$	$9\overline{)27}$	$4\overline{)20}$	$3\overline{)21}$	$9\overline{)81}$
10.	$4\overline{)24}$	$8\overline{)72}$	$5\overline{)35}$	$8\overline{)24}$	$7\overline{)42}$	$5\overline{)15}$	$9\overline{)54}$
11.	$8\overline{)40}$	$7\overline{)63}$	$8\overline{)64}$	$6\overline{)30}$	$9\overline{)36}$	$8\overline{)72}$	$6\overline{)42}$
12.	$8\overline{)32}$	$6\overline{)54}$	$5\overline{)25}$	$9\overline{)63}$	$8\overline{)48}$	$9\overline{)45}$	$7\overline{)28}$

How much is $2 \times 2 \times 2 \times 2 \times 0$?



CAN YOU COUNT CHANGE?

Carl will help sell melons this summer. He is practicing counting change.

1. If a man gives Carl a half dollar for a small watermelon and a small cantaloupe, what should Carl say and what change should he give the man? His prices are on the signs.

Carl gave a nickel and a dime in change.

He said, "That's 35¢, 40, 50." Was he right?

• When you make change, you add the amounts bought. Then you count and give coins and bills until you reach the amount the buyer gave you.

2. A boy buys a large watermelon and a small cantaloupe. He gives Carl a dollar to pay. How does Carl say the change? Is there more than one way?

3. A woman buys two small watermelons and a large cantaloupe. She hands Carl a dollar. What does he say?

4. A man buys 2 small watermelons and a small cantaloupe. He gives a half dollar and a quarter. What does Carl say?

5. A girl buys 1 large watermelon and 4 small ones. What does she get back from two dollars?

6. Twelve big cantaloupes in the basket sell for $2.00. How much cheaper are they by the basket?

PRACTICE

Multiplication and Division

	a	b	c	d	e	f
1.	$\begin{array}{r} 212 \\ \times\ 4 \end{array}$	$\begin{array}{r} 213 \\ \times\ 7 \end{array}$	$\begin{array}{r} 151 \\ \times\ 6 \end{array}$	$\begin{array}{r} 234 \\ \times\ 9 \end{array}$	$\begin{array}{r} 368 \\ \times\ 3 \end{array}$	$\begin{array}{r} 341 \\ \times\ 5 \end{array}$
2.	$2\overline{)120}$	$5\overline{)205}$	$3\overline{)279}$	$6\overline{)300}$	$4\overline{)248}$	$8\overline{)320}$
3.	$4\overline{)168}$	$3\overline{)156}$	$5\overline{)175}$	$2\overline{)456}$	$9\overline{)198}$	$7\overline{)147}$

GROWTH TEST

1. Multiply $\begin{array}{r} 758 \\ \times\ 9 \end{array}$	**2.** $41 \div 9$	**3.** $\frac{1}{4}$ of 32	**4.** $\begin{array}{r} 547 \\ 878 \\ 969 \end{array}$
5. Subtract $\begin{array}{r} 255 \\ -\ 196 \end{array}$	**6.** Subtract $\begin{array}{r} 906 \\ -\ 369 \end{array}$	**7.** $7\overline{)665}$	**8.** 7×806
9. $\begin{array}{r} 67 \\ 65 \\ 57 \\ 87 \end{array}$	**10.** $\begin{array}{r} 4100 \\ \times\ 3 \end{array}$	**11.** $8\overline{)505}$	**12.** Multiply $\begin{array}{r} 32 \\ \times\ 32 \end{array}$
13. $914 - 236$	**14.** $\begin{array}{r} 978 \\ 99 \\ 826 \\ 91 \end{array}$	**15.** $9\overline{)8629}$	**16.** $\begin{array}{r} 432 \\ \times\ 12 \end{array}$
17. $\begin{array}{r} 185 \\ \times\ 25 \end{array}$	**18.** $4\overline{)3010}$	**19.** Subtract $\begin{array}{r} 3004 \\ -\ 2494 \end{array}$	**20.** $\begin{array}{r} 659 \\ 7794 \\ 6898 \end{array}$

Television

P.M.	Channel	Program
6:30	(2)	Western Films
	(4)	Sports
	(8)	Joey, the Clown
6:45	(4)	News
	(8)	Your Dog
7:00	(4)	Camera Club
	(8)	Fun Films
7:30	(2)	Story Time
	(4)	Circus Acts
	(8)	Music

TIME SCHEDULES

1. Martha likes the *Fun Films.* What time may she see them?

2. When can one see and hear *Story Time*?

3. When might you see lessons about training a dog?

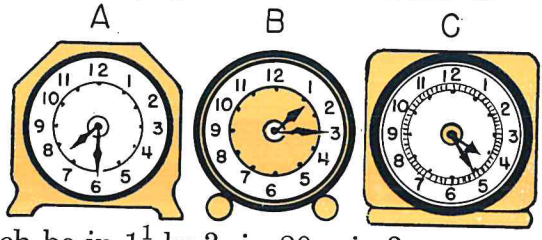
4. *Joey, the Clown,* is on Channel 8 at what time?

5. What three programs come at 7:30?

6. What is on Channel 4 at 6:30?

Sometimes television or a radio program is an hour different from your time. Why is that? Can the reason be **time zones?** or **daylight saving?** The United States is divided into 4 time zones. The day starts at the same hour by the clock, but clocks are one hour different in each time zone. You may hear radio or see television programs from other time zones.

With daylight saving time, all clocks are set ahead one hour the last Sunday in April. Your dad then quits work at the same hour by the clock, but an hour earlier by the sun. He saves an hour of daylight for other work or play before it gets dark.



7. Add 1 hour to each clock.

8. Take 1 hour away from each.

9. What time will each be in $1\frac{1}{2}$ hr.? in 20 min.?

10. Write these Roman numbers with digits:

V VI IX III XI VII X VIII XII II IV

SIMILAR KINDS OF THINGS

One word in each row is not like the other three words. Pick out the word that does not fit. Tell why it does not.

1. pound inch yard foot
2. cent dime quarter store
3. multiply six divide add
4. clock hour day minute
5. product multiplier quotient multiplicand
6. far heavy near close
7. dividend multiplicand divisor quotient
8. quart pint gallon foot
9. cold tall short average height
10. ten one forty hundred
11. dozen pair single gallon

PRACTICE

(1)	(2)	(3)	(4)	(5)	(6)	(7)
368	657	78	355	779	553	569
34	89	775	769	368	725	865
800	963	457	98	685	679	679

(8)	(9)	(10)	(11)	(12)	(13)	(14)
$4\overline{)312}$	$3\overline{)801}$	$5\overline{)235}$	$8\overline{)560}$	$7\overline{)498}$	$6\overline{)127}$	$9\overline{)936}$

Subtract:

(15)	(16)	(17)	(18)	(19)	(20)	(21)
931	750	230	906	163	105	114
787	563	57	869	84	76	49

Multiply:

(22)	(23)	(24)	(25)	(26)	(27)	(28)
486	378	697	469	469	759	758
7	9	6	8	9	7	8

UNDERSTANDING WORDS

Choose one of the three words at the right which is the best meaning of the item at the left:

1. Two of something: single couple alone
2. Near the middle: average estimate nearly
3. Only one: plural team single
4. All of it: part entire both
5. To end: finish get more start
6. To make less: increase measure reduce
7. To keep going: tally enter continue
8. To change direction: spin turn upset
9. Not enough: many uneven too few
10. The cost of a trip: average expenses exactly
11. What you think it will be: an estimate a portion
12. Part: middle total fraction

PRACTICE

Subtract:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
831	407	202	310	160	110	212
559	338	97	258	94	96	174

Multiply:

(8)	(9)	(10)	(11)	(12)	(13)	(14)
214	324	223	121	202	320	200
31	12	31	43	42	12	43

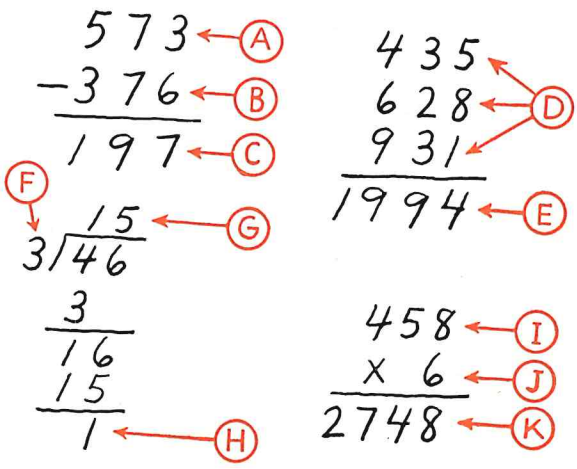
Add:

(15)	(16)	(17)	(18)	(19)	(20)	(21)
848	659	365	486	638	866	379
679	587	798	987	695	589	864

(22)	(23)	(24)	(25)	(26)	(27)	(28)
$3\overline{)704}$	$2\overline{)906}$	$4\overline{)720}$	$6\overline{)792}$	$3\overline{)645}$	$5\overline{)205}$	$4\overline{)832}$

WORDS USED IN ARITHMETIC

Write the letters *A* to *K* on an answer sheet. Match each one with the number of the right word in the list, like this: *A*-5, because *A* is the minuend.



1. Addends
2. Difference
3. Dividend
4. Divisor
5. Minuend
6. Multiplicand
7. Multiplier
8. Product
9. Quotient
10. Remainder
11. Subtrahend
12. Sum

ESTIMATING MONEY

Before you work a row of examples, look at each one and write your estimate of the answer in a number of dollars, without the cents. How closely did you estimate?

Multiply the last row.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
$2.69	$3.50	$4.75	$2.98	$1.25	$1.49	$2.99
.85	.60	6.98	.75	4.97	.67	.48
2.38	3.00	.79	1.97	3.78	2.78	1.95

(8)	(9)	(10)	(11)	(12)
3)$6.75	4)$8.48	2)$5.98	3)$9.15	5)$10.00

(13)	(14)	(15)	(16)	(17)	(18)	(19)
$1.95	$3.75	$0.95	$2.50	$3.45	$1.50	$1.98
6	8	4	6	4	10	7

PROBLEM SOLVING TEST

1. How many more dolls has Helen than Grace? Helen has 12 dolls and Grace has 7.

2. Joe says he will read an average of 50 pages a day for 56 days. How many pages is that in all?

3. Marilyn buys pencils for 36¢. She gives a half dollar to the clerk. What is her change to be?

4. Susan is writing 24 invitations. She has done 13. How many does she still have to write?

5. Ronnie worked 12 examples in 6 minutes. How many did he average a minute?

6. The first day Jim's family went 300 miles. That is $\frac{1}{3}$ of the way. How far is the whole way?

7. Sally's dad will eat lunch at home today. How long will he have for lunch from 11:45 to 1:15?

8. How many pages are there to read from page 132 to page 256?

9. Dick weighed 72 lb. He gained 2 lb. in 6 months. How many more pounds must he gain to weigh 75 lb.?

10. Helen measured the width of the classroom. It is 8 yd. 2 ft. How many feet is that?

11. Eight boys on a hike need 2 pt. of water each. How many gallons will all of them need?

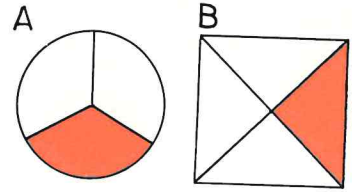
12. Jackie buys groceries for 64¢. How much change should he get back from a dollar bill?

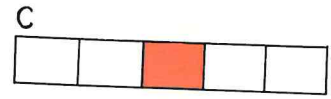
13. Jane's mother asked her to get 90¢ worth of 6¢ stamps and 60¢ worth of 3¢ stamps. How many 3¢ stamps will she get?

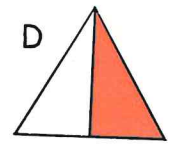
14. How much will 4 cans of dog-food cost? Jim paid 25¢ for 2 cans.

15. Who rode the faster? Doris rode her bicycle 4 miles in 1 hour. Martha rode 6 miles in 2 hours.

FRACTIONS TEST







1. What part of the square is red? of the circle? of the triangle? of the long rectangle?

2. What part of each figure is not red?

3. Which of these is the largest part of the same thing?

$\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{5}$

4. Which part in Ex. *3* is smallest?

5. Which is the smallest part of a dollar? $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{10}$

6. How much is $\frac{1}{4}$ of 8? of 12? of 20? of 32?

7. How much is $\frac{1}{3}$ of 9? of 12? of 21? of 300?

8. Which is more, $\frac{1}{3}$ of a dozen or $\frac{1}{4}$ of a dozen?

9. Which is larger, 1 whole apple or $\frac{1}{2}$ of it?

10. Would you rather have 1 whole dime or $\frac{1}{2}$ dollar?

11. Which is larger, $\frac{1}{2}$ yard or 1 whole foot?

12. How many minutes are in $\frac{1}{2}$ hour?

MIXED PRACTICE

1. $7657 + 7839$
2. $263 - 178$
3. 3×385
4. $172 \div 4$
5. $450 \div 6$
6. 4×709
7. $59 + 59 + 56 + 96$
8. $806 \div 2$
9. 6×890
10. $110 - 34$
11. $8377 - 7969$
12. $330 \div 7$
13. 5×4100
14. $3\overline{)6288}$
15. $807 + 9566 + 679$
16. $8\overline{)6065}$
17. $69 + 367 + 27 + 9872$
18. 19×23
19. $1315 - 788$
20. 127×79

PRACTICE IN CHECKING. Be sure!

1. Add both down and up.

a. 667
579
985

b. 369
798
858

2. Difference plus subtrahend equals the minuend.

a. 662
−597

b. 1246
−749

3. Change the places of the multiplier and multiplicand.

a. 379
×6

b. 182
×37

4. Divisor × Quotient (plus remainder) equals dividend.

a. $9\overline{)405}$

b. $7\overline{)514}$

HOW WELL CAN YOU ADD?

1. 314 273	**2.** 140 25	**3.** 319 352	**4.** 427 480	**5.** 806 403
6. 304 587	**7.** 462 47	**8.** 563 249	**9.** 904 506	**10.** 386 487
11. 903 658	**12.** 868 496	**13.** 475 897	**14.** 383 976	**15.** 563 255
16. 69 644 307	**17.** 848 936 447	**18.** 356 989 667	**19.** 768 765 436	**20.** 479 897 829

21. 27 + 85 + 8 + 94

22. 7 + 59 + 8 + 57

HOW WELL CAN YOU SUBTRACT?

Set 1. Subtraction

1. 94 76	**2.** 73 68	**3.** 867 723	**4.** 985 867	**5.** 927 783
6. 679 624	**7.** 824 698	**8.** 293 257	**9.** $3.29 2.76	**10.** $4.25 3.48
11. $1.49 .27	**12.** $1.75 .26	**13.** $2.25 .89	**14.** $3.45 .92	**15.** $1.29 .35

Set 2. Subtraction

1. 345 342	**2.** 242 212	**3.** 564 530	**4.** 840 608	**5.** 432 406
6. 431 428	**7.** 105 81	**8.** 126 96	**9.** 721 660	**10.** 925 885
11. 500 408	**12.** 640 585	**13.** 920 756	**14.** 540 480	**15.** 503 450
16. 202 177	**17.** 406 336	**18.** 110 82	**19.** 340 306	**20.** 410 354

Mary is now twice as old as her brother, Joe. When Joe was 1 year old, Mary was 4 times as old as Joe. How old is Mary now?

Answer: six years old.

HOW WELL CAN YOU DIVIDE?

(1)	(2)	(3)	(4)	(5)	(6)	(7)
$3\overline{)36}$	$2\overline{)168}$	$3\overline{)639}$	$4\overline{)804}$	$2\overline{)60}$	$6\overline{)120}$	$3\overline{)960}$
(8)	(9)	(10)	(11)	(12)	(13)	(14)
$2\overline{)92}$	$6\overline{)69}$	$5\overline{)75}$	$7\overline{)218}$	$2\overline{)649}$	$4\overline{)136}$	$7\overline{)169}$
(15)	(16)	(17)	(18)	(19)	(20)	(21)
$8\overline{)977}$	$2\overline{)506}$	$5\overline{)608}$	$4\overline{)816}$	$7\overline{)715}$	$2\overline{)421}$	$3\overline{)405}$
(22)	(23)	(24)	(25)	(26)	(27)	(28)
$4\overline{)901}$	$5\overline{)200}$	$4\overline{)300}$	$3\overline{)200}$	$2\overline{)300}$	$4\overline{)500}$	$6\overline{)800}$

HOW WELL CAN YOU MULTIPLY?

(1)	(2)	(3)	(4)	(5)	(6)	(7)
23	20	70	300	120	214	301
3	4	2	2	4	2	3
(8)	(9)	(10)	(11)	(12)	(13)	(14)
24	45	68	123	409	350	332
3	4	3	6	2	5	4
(15)	(16)	(17)	(18)	(19)	(20)	(21)
231	235	22	71	30	40	14
9	7	31	23	32	24	20
(22)	(23)	(24)	(25)	(26)	(27)	(28)
200	320	321	402	25	26	483
42	21	23	21	32	34	46
(29)	(30)	(31)	(32)	(33)	(34)	(35)
709	920	546	430	754	793	875
73	35	38	27	69	84	67

MIXED PRACTICE

Set 1

1. 47 cents + 89 cents

2. 9×604

3. $586 - 489$

4. $6\overline{)480}$

5. \$1.04 − \$0.69

6. $\frac{1}{3}$ of 279

7. $76 + 89 + 137$

8. 36×87

9. $301 \div 7$

10. $2400 + 800 + 96$

11. 54×648

12. $1512 - 208$

13. Add ten to each number:

a. 48 **b.** 165 **c.** 1880 **d.** 590

14. What is the average of 8, 6, 7, 9 and 5?

15. Write the number which means ten times as many as 20; as 150; as 1000.

Set 2

1. 12 dozen rolls are _?_ rolls.

2. 2 hours are _?_ minutes.

3. A quart holds _?_ pints.

4. 8 pairs of socks are _?_ socks.

5. 98¢ is almost one _?_.

6. $\frac{1}{2}$ pound is _?_ ounces.

7. 50¢ is _?_ dollar.

8. A piece of ribbon 6 yards long is _?_ feet.

9. 15 minutes are _?_ of an hour.

10. 8 quarts will fill _?_ gallon jars.

11. One day is _?_ hours.

12. Spring is followed by _?_.

13. $\frac{1}{4}$ of a candy bar is one of _?_ equal parts.

14. From 1:30 o'clock to 3:00 is _?_ hours.

15. 36 eggs are _?_ dozen eggs.

FACTS FOR THE ANSWER STRIP

(To be read by the teacher. Use weekly after page 78.)

ADDITION

Read "2 and 2," or "2 plus 2"; "5 and 2," or "5 plus 2."

a	b	c
1. 2 and 2	5 + 2	7 + 4
2. 5 and 5	3 + 8	9 + 6
3. 9 and 2	7 + 2	4 + 8
4. 0 and 6	5 + 3	6 + 9
5. 4 and 4	2 + 6	7 + 5
6. 9 and 0	3 + 4	9 + 4
7. 3 and 1	9 + 2	6 + 8
8. 0 and 4	3 + 6	3 + 9
9. 1 and 5	2 + 5	8 + 5
10. 3 and 3	4 + 3	9 + 3
11. 6 and 1	6 + 4	7 + 8
12. 2 and 9	8 + 3	5 + 9
13. 6 and 6	2 + 7	8 + 7
14. 2 and 4	9 + 9	9 + 5
15. 8 and 1	6 + 5	5 + 7
16. 3 and 2	7 + 3	8 + 9
17. 5 and 4	5 + 6	7 + 6
18. 2 and 8	3 + 7	9 + 7
19. 7 and 7	6 + 2	5 + 8
20. 2 and 4	7 + 4	7 + 9
21. 8 and 8	6 + 3	6 + 7
22. 2 and 3	8 + 4	9 + 8
23. 4 and 5	3 + 5	8 + 6
24. 8 and 2	4 + 6	4 + 9

SUBTRACTION

Read "2 from 4," or "4 minus 2"; or "7 minus 5."

a	b	c
1. 2 from 4	7 − 5	11 − 7
2. 5 from 10	11 − 3	15 − 9
3. 9 from 11	9 − 7	12 − 4
4. 0 from 6	8 − 5	15 − 6
5. 4 from 8	8 − 2	12 − 7
6. 9 from 9	7 − 3	13 − 9
7. 3 from 4	11 − 9	14 − 6
8. 0 from 4	9 − 3	12 − 3
9. 1 from 6	7 − 2	13 − 8
10. 3 from 6	7 − 4	12 − 9
11. 6 from 7	10 − 6	15 − 7
12. 2 from 11	11 − 8	14 − 5
13. 6 from 12	9 − 2	15 − 8
14. 2 from 6	18 − 9	14 − 9
15. 8 from 9	11 − 6	12 − 5
16. 3 from 5	10 − 7	17 − 8
17. 5 from 9	11 − 5	13 − 7
18. 2 from 10	10 − 3	16 − 9
19. 7 from 14	8 − 6	13 − 5
20. 2 from 6	11 − 7	16 − 7
21. 8 from 16	9 − 6	13 − 6
22. 2 from 5	12 − 8	17 − 9
23. 4 from 9	8 − 3	14 − 8
24. 8 from 10	10 − 6	13 − 4

FACTS FOR THE ANSWER STRIP

(To be read by the teacher. Use weekly after page 171.)

MULTIPLICATION

May be read as "6 fours," or "6 times 4." See page 322.

	a	b	c
1.	1 two	5 × 5	7 × 4
2.	7 ones	7 × 2	6 × 8
3.	3 ones	7 × 3	3 × 9
4.	2 twos	5 × 2	8 × 7
5.	2 sixes	8 × 4	9 × 4
6.	2 zeros	5 × 3	3 × 8
7.	1 five	6 × 0	5 × 6
8.	3 twos	3 × 4	9 × 7
9.	2 fives	5 × 7	4 × 8
10.	8 zeros	6 × 3	7 × 5
11.	9 twos	4 × 5	9 × 6
12.	2 eights	9 × 8	5 × 8
13.	3 zeros	6 × 4	4 × 7
14.	1 six	9 × 3	6 × 9
15.	2 sevens	5 × 4	7 × 8
16.	6 twos	9 × 9	4 × 9
17.	1 zero	6 × 5	6 × 7
18.	2 threes	4 × 3	8 × 8
19.	4 twos	8 × 9	7 × 9
20.	2 nines	3 × 7	8 × 5
21.	3 threes	4 × 4	4 × 6
22.	2 fours	6 × 6	7 × 7
23.	1 one	8 × 3	8 × 6
24.	8 twos	9 × 5	5 × 9
25.	3 fives	3 × 6	7 × 6

DIVISION

May be read as "How many 6's in 24, 3's in 12," or "24 ÷ 6, 12 by 3."

	a	b	c
1.	1's in 2	14 ÷ 7	28 ÷ 7
2.	7's in 7	25 ÷ 5	48 ÷ 6
3.	3's in 3	21 ÷ 7	27 ÷ 3
4.	2's in 4	10 ÷ 5	56 ÷ 8
5.	2's in 12	32 ÷ 8	36 ÷ 9
6.	2's in 0	15 ÷ 5	24 ÷ 3
7.	1's in 5	0 ÷ 6	30 ÷ 5
8.	3's in 6	12 ÷ 3	63 ÷ 9
9.	2's in 10	35 ÷ 5	32 ÷ 4
10.	8's in 0	18 ÷ 6	35 ÷ 7
11.	9's in 18	20 ÷ 4	54 ÷ 9
12.	2's in 16	72 ÷ 9	40 ÷ 5
13.	3's in 0	24 ÷ 6	28 ÷ 4
14.	1's in 6	27 ÷ 9	54 ÷ 6
15.	2's in 14	20 ÷ 5	56 ÷ 7
16.	6's in 12	81 ÷ 9	36 ÷ 4
17.	1's in 0	30 ÷ 6	42 ÷ 6
18.	2's in 6	12 ÷ 4	64 ÷ 8
19.	4's in 8	72 ÷ 8	63 ÷ 7
20.	2's in 18	21 ÷ 3	40 ÷ 8
21.	3's in 9	16 ÷ 4	24 ÷ 4
22.	2's in 8	36 ÷ 6	49 ÷ 7
23.	1's in 1	24 ÷ 8	48 ÷ 8
24.	8's in 16	45 ÷ 9	45 ÷ 5
25.	3's in 15	18 ÷ 3	42 ÷ 7

MEASURES AND NAMES WE SHOULD KNOW

LENGTH

12 inches (in.) = 1 foot (ft.)
36 inches (in.) = 1 yard (yd.)
3 feet (ft.) = 1 yard
5280 feet = 1 mile (mi.)

NUMBER MEASURES

2 things = 1 pair (pr.)
12 things = 1 dozen (doz.)
$\frac{1}{2}$ thing = 1 half
$\frac{1}{4}$ thing = 1 quarter

DRY AND LIQUID MEASURES

2 cups = 1 pint (pt.)
2 pints (pt.) = 1 quart (qt.)
4 quarts (qt.) = 1 gallon (gal.)
8 pints (pt.) = 1 gallon (gal.)

MEASURES OF WEIGHT

16 ounces (oz.) = 1 pound (lb.)
2000 pounds (lb.) = 1 ton (T.)

UNITED STATES MONEY

Decimal Units
1 cent (¢) = one cent
10 cents (¢) = one dime
10 dimes = one dollar ($)

Five cents = 1 nickel
2 nickels = 1 dime
5 nickels = 1 quarter dollar
4 quarters = 1 dollar
2 half dollars = 1 dollar

MEASURES OF TIME

60 seconds (sec.) = 1 minute
60 minutes (min.) = 1 hour
24 hours (hr.) = 1 day
7 days (da.) = 1 week
28, 29, 30, or 31 days = 1 month
12 months (mo.) = 1 year (yr.)
365 days = 1 year (yr.)
366 days = 1 leap year

DECIMAL SYSTEM

Ten Thousands	Thousands	Hundreds	Tens	Ones or Units
2	2,	2	2	2

ROMAN NUMERALS

I	1	VIII	8	XVI	16
II	2	IX	9	XVII	17
III	3	X	10	XVIII	18
IV, IIII	4	XI	11	XIX	19
V	5	XII	12	XX	20
VI	6	XIII	13	XXI	21
VII	7	XIV	14	XXIX	29
		XV	15	XXX	30

FLAT SHAPES

circle
square
triangle
rectangle

This page here—Page 320—is the last in this arithmetic book; up to 10 more pages would have applied, (including the index).